IO STATE
IVERSITY
26 1939
IBRARY

The CHEMIST

May, 1939

VOLUME XVI, NO 5

THE CASE FOR LICENSING

• • •

ANNUAL MEETING 1939

• • •

UNSOLVED PROBLEMS OF SCIENCE

• • •

THE YOUNG CHEMIST AND THE GOVERNMENT SERVICE

• • •

OPPORTUNITIES FOR WOMEN CHEMISTS

SULFUR DETERMINATIONS

For the determination of Sulfur in all its forms, Baker and Adamson has developed a complete line of the necessary reagent chemicals. Their high degree of accuracy makes possible results that are within the narrow limits permitted by today's rigid specifications.

B & A REAGENTS FOR SULFUR DETERMINATION

Code No.		Code No.	
1689	Easchka's Mixture, Reagent	2122	Potassium Nitrate, Cryst., Reagent, A.C.S.
2448	Zinc Oxide Powder, Reagent Gr.	2099	Potassium Bromide, Reagent, A.C.S.
2227	Sodium Carbonate, Anhydrous, Reagent, A.C.S.	2272	Sodium Peroxide Powder, Reagent, A.C.S.
1121	Nitric Acid, Fuming, Reagent Gr.	2118	Potassium Hydroxide, Reagent, A.C.S.
2255	Sodium Hydroxide Pellets, Reagent, A.C.S.	2202	Sodium Bicarbonate Powder, Reagent, A.C.S.
2105	Potassium Chromate, Cryst., Reagent, A.C.S.	2429	Zinc Metal, Granular, Reagent
1554	Carbon Tetrachloride, Reagent, A.C.S.	1917	Magnesium Oxide Powder, Special Low Sulfur, A.C.S.
1472	Bromine, Reagent, A.C.S.	1400	Barium Chloride, Crystal, Reagent, A.C.S.

also C. P. Acids and Ammonia

FINE CHEMICALS FOR LABORATORY REAGENTS

SETTING THE PACE IN CHEMICAL PURITY SINCE 1882

BAKER & ADAMSON Reagent Chemicals AND C.P. Acids

Division of GENERAL CHEMICAL COMPANY, 40 Rector St., New York

ATLANTA • BALTIMORE • BOSTON • BUFFALO • CAMDEN, N. J. • CHARLOTTE, N. C. • CHICAGO • CLEVELAND
DENVER • HOUSTON • KANSAS CITY • LOS ANGELES • MILWAUKEE • MINNEAPOLIS • MONTEZUMA, GA. • PITTSBURGH
PROVIDENCE, R. I. • SAN FRANCISCO • ST. LOUIS • UTICA, N. Y. • WENATCHEE, WASH. • YAKIMA, WASH.
IN CANADA: THE NICHOLS CHEMICAL COMPANY, LIMITED • MONTREAL • TORONTO • VANCOUVER

The CHEMIST

Publication of

THE AMERICAN INSTITUTE OF CHEMISTS, INC.

V. F. KIMBALL, *Editor*, 233 Broadway, New York City

VOLUME XVI MAY, 1939 NUMBER 5

TABLE OF CONTENTS

	Page
The Case for Licensing — *Robert J. Moore, F.A.I.C.*	223
Annual Meeting 1939	231
Unsolved Problems of Natural Science — *Rudolf Seiden*	234
The Young Chemist and the Government Service — *Louis Marshall, F.A.I.C.*	240
Opportunities for Women Chemists — *M. R. Bhagwat, F.A.I.C.*	250
Charles R. Ely	252
Arthur Edward Hill	252
Annual Meeting Reports	254
Council	265
Chapters	269
Books	275
Northern Lights — *Howard W. Post, F.A.I.C.*	280
The Science Angler — *Kenneth E. Shull, J.A.I.C*	281
Employment	282

THE AMERICAN INSTITUTE OF CHEMISTS
HOWARD S. NEIMAN, *Secretary*
233 Broadway
New York, N. Y.

Entered as second class matter April 8, 1936, at the Post Office at New York, N. Y., under Act of August 24, 1912.
Issued monthly except in June, July and August at 233 Broadway, New York, N. Y.
Subscription price, $2.00 a year. Single copy, 25 cents.
Copyright, 1939, by The American Institute of Chemists, Inc.

UNDERSTANDING...
a simple formula that builds business

Baker Chemists *understand* the need for Laboratory Reagents that can be trusted. They know the chemists' problems — for they are chemists.

That's why every package of Baker's C. P. Analyzed Reagents bears an accurate analysis on the label.

Baker Distributors know what the chemist wants in quality. They know what the chemist wants in service. Through their constant contacts, through their knowledge of each chemist's local problems, they have selected the brand that serves efficiently — Baker's C. P. Analyzed Reagents.

The Nation's Chemists know that Baker's C. P. Analyzed Reagents can be relied upon — that they save time. These chemists *understand* values. They appreciate the services rendered by the Baker Distributors.

Understanding between Chemist, Distributor and Manufacturer — that's the simple formula that builds business.

J. T. BAKER CHEMICAL CO.
Phillipsburg, New Jersey

NEW YORK 420 Lexington Ave. | PHILADELPHIA 220 South 16th St. | CHICAGO 435 N. Michigan Ave.

Specify "Baker's Analyzed"

"Baker's C. P. Analyzed" Reagents Are Sold by Representative Laboratory Supply Houses

The Case for Licensing

By **Robert J. Moore**

***President,* The American Institute of Chemists**

Why does The American Institute of Chemists favor licensing for the profession in New York State? The answer is given in this article by its President.

THE National Council of THE AMERICAN INSTITUTE OF CHEMISTS, after studying for several years the question of state licensing of chemists, decided this year that to temporize further would but jeopardize the best interests of the profession. As the initial step, a New York State Licensure Committee was appointed, to all the meetings of which the officers of all New York State Sections of the American Chemical Society were invited. The deliberations of this committee resulted in the proposed act, "To Amend the Education Law of New York State with Respect to Practice as Professional Chemist". By this act, administered under the Regents of the University of the State of New York, all professional or consulting chemists who hold themselves out as such to the public, would be required to obtain a license. The chemist in private practice or employed by a company or corporation is not affected. He may secure a professional license, however, if he can qualify and so desires.

Abstract of the Licensure Act

"In order to safeguard life, health, and property any person practicing or offering to practice as a professional chemist in this State subsequent to January 1, 1940, must submit evidence that he is qualified so to practice and must be licensed as hereinafter provided. After January 1, 1940, it shall be unlawful for any person to practice or offer to practice in this State as a professional chemist or to use the title professional chemist or any title, card, sign or device in such manner as to tend to convey the impression that such person is practicing as a professional chemist, unless such person is duly licensed under the provisions of this article. Every holder of a license shall display it in a conspicuous place in his principal office. Every licensed professional chemist shall have a seal, approved by the board, which shall contain his name and the words 'Licensed Professional Chemist'. All analyses, opinions, and reports

prepared by or under the supervision of such licensed professional chemist shall be stamped with said seal."

The act provides for a board of examiners of professional chemists, each of whom shall be a chemist with at least ten years of practice in responsible charge of chemical work.

Qualifications for License

The applicant must submit evidence of graduation from a recognized institution with a bachelor's degree in chemistry or its equivalent as determined by the department. In addition, he must have completed five years of practical experience in chemistry of a grade and character satisfactory to the board. Each year of post graduate study may be accepted by the board, up to a total of three years, in lieu of a like number of years of practical experience. In addition, each applicant shall submit at least three certificates testifying to character, competency, and qualifications.

The Department may waive specific qualification requirements, except as to age, character and citizenship, in case of applicants who are possessed of long established and recognized standing in the chemical profession, who have practiced for at least fifteen years.

Copies of the Act for Individual Study

Mimeographed copies of the Act for study by individual chemists or chemical organizations may be obtained from the Chairman of the Licensure Committee, Dr. Joseph W. E. Harrisson, of La Wall & Harrisson, 214 South 12th Street, Philadelphia, Pennsylvania.

Why Not State License for Chemists?

We chemists as a class are irked by any thought of restricting our activities or, to quote a recent catchword, by threats of "regimentation". But we do not hear the medical profession, lawyers, or engineers complaining of regimentation. They regard their State License Laws as defining their profession — as a safeguard against threatening invasion. And today, whether in professional organizations or national politics, democracy must regiment itself for defense. The average American chemist has too long neglected his profession in his zeal for his science. He has given his full attention to chemical and physical laws which Nature controls, and has left untouched the reactions, both professional and political, which he himself should control. He has built the greatest Chemical Society on earth with unsurpassed advancement to the Science of Chemistry and its publications. But he has fallen far behind his brethren in the medical, legal and engineering worlds in his contacts

with life about him. Chemistry is today the only major profession without state definition or the legal authority gained by state licensing. On the other hand, Law, Medicine, Architecture, Engineering — all are licensed and legally defined as professions. When the layman approaches any of these for professional aid, he knows that to practice as such each of these professionally licensed men must have had adequate qualifications. Consider the chemist by comparison! Anyone can hang out his shingle as a "consulting or analytical chemist". He may have had but a year in correspondence schools and occasional employment in a laboratory to become, perforce, a "chemist". The word "chemist" is flaunted on many a corner drugstore; any half-wit may concoct a soap, ointment or flea-killer and call himself a National Chemical Laboratory, Incorporated. And as long as there is no state regulation governing the use of the professional term chemist, we will have the public and the small employer duped by charlatans and those insufficiently trained. And along with it will occur that type of competition with the employed junior and senior chemists from the irresponsible group who call themselves "chemists" but who would barely rate as laboratory technicians. There is much to be said for the State Licensing of *all* chemists. The subject is one for further thought and study by our societies. But certainly, it seems there can be no valid argument against the licensing of *professional* chemists who hold themselves out as such to the public, the employer and the State.

The sign John Smith, Professional Chemist, should have as much significance in its way as John Jones, Counselor at Law, or Richard Roe, Chemical Engineer. At present, it does not. Mr. Jones and Mr. Roe are licensed to professional practice by a board which certifies to their education, experience and character. Is Mr. Smith, the chemist mentioned above, qualified and competent to check and pass upon the materials in a large construction job? Failing to know him personally, we cannot tell. If the inquiry, however, is about Mr. Roe, the engineer, the answer is simple. He is licensed as a Professional Engineer by the Regents of the State of New York.

Similarly the courts of this State can be, and are to our knowledge, sometimes confused if not mislead by testimony of persons having some training as chemists but not properly qualified by education and experience. Much of this would be eliminated if the individual could establish that he was a licensed professional chemist. It would, naturally, still remain for him to qualify as an expert in the particular field of chemistry under question. Such conditions already obtain for the

Chemical Engineer who is licensed professionally in New York State.

Dr. Charles L. Parsons, Secretary of the American Chemical Society, recognized the necessity of state licensing this January when he wrote, "It has begun to look as if licensure of chemists having to do with factual determinations utilized by the physician in the diagnosis and prognosis of disease *must be brought about to protect the public from the large number of incompetents who are now doing this type of work quite legally.*" The only legal way of preventing those improperly trained from competing with responsible chemists is through state licensure. In the January 23, 1939, newspapers, Dr. Parsons urged that all those making chemical determinations to be used by physicians shall be licensed by the State. In this he spoke for the American Chemical Society.

It is equally evident that if construction materials, foodstuffs and hundreds of other products are submitted to a chemist to pass on their quality, there should be some basis for establishing the competency of that chemist. If not properly qualified, he may either cause a substantial loss by reporting materials unsatisfactory which are, in fact, satisfactory, or may endanger life and health by reporting dangerous materials as satisfactory. Further, for the consultant who deliberately issues fraudulent and misleading reports there should be a restraining authority. Today he might be censured by the committees on professional ethics of his professional or scientific societies, but these cannot restrain him from practice. Under the proposed bill, any practitioner found guilty of fraud, deceit or gross negligence may have his license and registration to practice revoked, suspended or annulled by the board.

We chemists like to think of ourselves as professional men—as wearers of those academic robes steeped in the cultural traditions of the past and emblazoned with the bright glories of the future. But without the legal basis guaranteed by statute, our claims to professional standing are inconclusive. The "three professions, the learned professions", accepted by tradition are theology, law, and medicine. Our scientific work, research and development, and our code of ethics for practice have in recent years placed chemistry with these three earlier professions in the minds and acceptance of scientific and professional men. For example, the Editor, himself, of *Industrial and Engineering Chemistry* states (**31**, No. 5, p. 497, 1939), "We are among those to whom it has never occurred to question the professional status of chemistry".

But it is one thing to have eminent chemists and high court jurists admit that chemistry is a profession, and it is quite another matter to

bring this aspect of our activities to the attention and acceptance of legislators, labor unions and the general public.

Labor Unions and Our Need for Legal Professional Status

We are all acquainted with the rise in labor organization and with the annoying problem presented of labor leaders attempting to force every type of employee into some form of union, using either political or official pressure. Every chemist should be alert to the growing threat to organize chemists in labor unions. Many chemists, especially in academic fields, seem loathe to recognize this threat to our professional standing. It is simple and comfortable to light a pipe and smilingly say, "It can't happen here". But it is happening! Witness the recent strike which closed a Brooklyn, New York, plant, and which, the public reads in newspapers, was called by the Federation of Chemists and Technicians, a C.I.O. affiliate. Witness the many instances we have of experienced chemists, seeking employment in the research and control laboratories of unionized plants, being told to first see the union organizer. We have letters from chemists stating that it is humiliating to them to be forced to join a C.I.O. union before being considered for research jobs.

Recently, in New York City, chemists were forbidden by the union organization to leave their laboratories in order to conduct plant runs, unless they joined the union. The engineers were allowed to come and go as they pleased without question, since they were professional men, so licensed by the State. But the chemist was just another employee in a lab coat instead of overalls, who could submit no such state authority of professional status.

Witness, also, the recent correspondence with Joseph E. Seagram & Sons, Incorporated, of Baltimore (*Industrial and Engineering Chemistry* News Ed. 17, p. 249, April 10, 1939) in which it develops that all professional men, not employed in a supervisory capacity, are required to join the Distillery Worker's Union as a condition of employment.

Perhaps requiring even graver consideration are the veiled threats we have been hearing, that many of our larger plants employing research and laboratory forces are being organized by the C.I.O. And it has been openly stated that unless the chemists joined the union in order to maintain a closed shop the plants would be closed by strike.

To guard against these attempts to submerge our profession in an engulfing sea of unionization, we must speak boldly and use every weapon at our command to impress the public and the lay mind of labor that the chemist may not be classified as in a trade or labor group. The *chemist* is *not* a laborer, mechanic or artisan. The trade or labor union

does not apply! The chemist is a professional man, even if he leaves his laboratory momentarily to conduct plant runs; even though in overalls and with a monkey wrench instead of in lab coat and with a test tube, he appears to the myopic eye of labor organizers to be stepping into production work. William Green, President of the American Federation of Labor, which has been more reasonable in its attitude than the more radical union, states, "If engineers and chemists perform professional work they should be classified accordingly. If they do production work they must be classified as production workers." In our large chemical industries, who can say where professional chemistry leaves off and production begins? Our ablest chemists are called upon to see the laboratory experiments through to production. Our outstanding chemists are found working with labor shifts to determine yields, maintain quality or correct variations.

In all these conflicts with organized labor, the trouble is due to the lay minds not recognizing chemistry as a profession. In this they are aided and sustained by the lack of any State law defining or licensing chemistry as a profession. We feel that definite steps must now be taken to offset this, and that the present bill offered to New York State is a forward movement in our professional defense.

The State Law as an Aid to Professional Classification of Chemists

For years the Professional Society of Chemists has been working for fairer classification of the large numbers of chemists employed by State, Federal, City, Army, Navy and Civil Service departments. These efforts have met with some measure of success. For example, in certain Navy and City units it has been possible to take the chemist from categories in which he was classified along with painters, carpenters and even street cleaners, and place him in a more professional status, with resulting salary and retirement advantages. The adoption of State license laws for the profession would automatically accomplish this classification of all such chemists who were qualified by education and experience to warrant a professional certificate. This certificate would be more potent than the claims and efforts of a private organization—it would bespeak the legal professional classification defined by the law of the State.

In New York State a great body of chemists employed in engineering, chemistry and other technical divisions, are deprived of proper classification through lack of professional license. Under the Hamilton Act, known as the Career Bill, laboratory engineers with junior, assistant and senior titles require professional state license. The same three grades of chemists have no license requirements and, accordingly, have

been classified in lower grades than the professional engineers, at correspondingly lower salaries and retirement features. In order to correct this inequality, the New York State chemists are anxiously awaiting the enactment of the proposed bill. They ask their brother chemists in industry and scholastics to aid the State Licensing Act.

Objections to and Criticism of the Proposed Act to License Professional Chemists

A calm and critical study of the proposed bill reveals that it is designed to license one group of so-called professional chemists who deal directly with the public. Some of the criticism raised against the bill comes from a few who have not read it or from a group in purely academic fields who are far-removed from the problems affecting the professional man. In a recent open discussion, the question of *pro* or *con* in connection with the bill under consideration was lost completely in the larger and diverse question regarding the licensing of *all* chemists. As a result, there was no opportunity for study of the immediate proposal.

One college professor, after a hasty perusal of one of the earlier drafts of the bill, writes, "It strikes me that it is a singularly pernicious bit of legislation". He offers no reason why, requests no further information and merely discusses methods of combatting the bill.

A recent editorial criticism appears to miss the point entirely. Instead of calmly discussing the *pro* and *con*, it starts with the prejudiced question, "How would you like to exchange some of your diminishing liberty for a license to practice your profession of chemistry?" It then states that "the license cannot outrank a diploma earned at a recognized educative institution and supplemented with a reasonable number of years of practice". The answer to this is, "Naturally; no one says it does". But that is not the point. Today, without legal status or definition, a person needs *no* recognized diploma, *no* experience whatever to set himself up as a chemist — to practice before the public or to compete with an authentic chemist of industry.

The editorial then develops the next criticism that "one of the difficulties about a license in chemistry is the diversity of the science itself". It implies that a licensed chemist, proficient in acid manufacture, might be relatively uninformed in cellulose or tanning. Well, that does not change the situation as it is today, except that a state certificate would at least testify to his basic training and experience as a chemist. Moreover, the medical profession is duly licensed covering basic training and internship, and it, too, is widely diversified. So, also, is engineering.

The editorial's next and final criticism is too distinctly malicious to go

without answer. It states, "We believe we are correct in saying that the idea of licensing the engineers and chemists stems from the efforts of certain groups who conceived this to be a method whereby the consultants and practitioners in a given state could make out-of-town competition quite difficult . . . ". It is *not* correct. The Council of the INSTITUTE has studied the question of State licensing for years, without any thought of competition to out-of-state groups. A mere glance at the personnel of the council would have prevented this lapse into bad taste. Moreover, the bill provides that any professional chemist, not a resident of nor doing business in New York, may practice thirty days in any year without license, provided he is legally qualified for such practice in his own state. Even non-citizens, duly qualified, may receive temporary permits for any specific case. Further, the New York Department may issue a license to any chemist who holds a license from his own state where the standards are not lower than in New York.

The editorial finally does state before concluding that "It may be that special groups of chemists practicing in restricted fields may some day be licensed by the States". The bill under discussion is just that: for the licensing of the special group of professional chemists.

Regimentation

The other most frequent objection uses the catchword "regimentation". But perhaps regimentation into a publicly accepted and legally constituted profession may be desirable! Let us join in such a common front for defense—not wait idly without action until we are hog-tied and tethered by labor rulings. Let us write our *own* professional license laws—not wait for laws loosely written, or connived by individuals and organizations of questionable training.

Conclusion

It is believed that the passage of this bill is desirable, if not in fact essential, in order to supplement those services which are already supervised in the State of New York by the Regents through other licensing acts under the State Education Law. It should be stressed that chemistry is not an isolated field but one which borders on several already licensed by this State. From the legislative angle, there appears to be a hole in the roof of protection erected over the public by the required licensing of professional practitioners, and this act is designed to cover that hole in order to protect the public.

From the chemist's standpoint, the question of licensing has been considered *pro* and *con* in discussion and published articles during the

past ten years. We conclude now that this bill contains nothing to affect adversely the chemist or his work. We submit, however, that in considering our relations to the other licensed professions, to organized labor, to the public and to the State, this bill is a forward step in defense of the chemist and in the maintenance of his future professional integrity.

Annual Meeting 1939

The American Institute of Chemists adopts a resolution in favor of licensing those chemists directly engaged in serving the public.

THE World of Tomorrow, as symbolized by the World's Fair, New York, was an appropriate setting for the seventeenth Annual Meeting of THE AMERICAN INSTITUTE OF CHEMISTS held on May 13, 1939, with two hundred members and guests enthusiastically participating in plans for the future professional welfare of American chemists.

President Robert J. Moore opened the meeting with the statement: "The chemist feels quite at home in the World of Tomorrow. The chemist today, through his reactions, experiments, and dreams, is already living in the World of Tomorrow. We realize this even more keenly as we witness the application of the science of chemistry to the science of life."

Reports from the officers, committees, and chapters were presented. The licensing program for chemists in New York State was discussed, and Dr. W. D. Turner presented the following resolution:

"Resolved, that this annual meeting of THE AMERICAN INSTITUTE OF CHEMISTS assembled, places itself on record, in the interest of properly safe-guarding the public health and welfare, as favoring legislation which will provide for licensing of all professional chemists engaged directly in serving the public, in order to insure their adequate qualification." This resolution was adopted.

New Councilors Elected

HENRY G. KNIGHT

© *Blackstone*

FOSTER D. SNELL

© *Bachrach*

DONALD H. ANDREWS

The election of three new councilors for the term 1939-1942 was announced: Dr. Henry G. Knight, Chief, Bureau of Chemistry and Soils, U. S. Department of Agriculture, Washington, D. C.; Dr. Donald H. Andrews, Professor of Chemistry, Johns Hopkins University, Baltimore, Maryland, and Dr. Foster D. Snell, Consulting Chemist, Brooklyn, New York. The retiring councilors are: Mr. Frank G. Breyer, Consulting Chemist, Brooklyn, New York; Dr. Harry L. Fisher, Research Chemist, U. S. Industrial Alcohol, Stamford, Connecticut, and Dr. Neil E. Gordon, Chairman, Department of Chemistry, Central College, Fayette, Missouri.

A resolution confirming the acts of the Board of Directors and Council for the year 1938-1939 was adopted.

A vote of thanks was extended to Dr. Gerald Wendt for his kindness in making arrangements for the meeting to be held at the World's Fair. A vote of thanks was also given to the officers, councilors, committee members, and chapters for their work during the year.

Complete reports of the year's activities will be found on pages 254 to 265 of this issue of THE CHEMIST.

A tour of the science section of the World's Fair, conducted by Dr. Gerald Wendt, director of science and education, World's Fair, was well attended despite the unfavorable weather.

After the tour of the grounds, those attending the meeting were guests of the B. F. Goodrich Company at a special safety demonstration

in the Goodrich Arena. Dr. Foster D. Snell introduced President Robert J. Moore, who spoke briefly over the World's Fair public address system. "The chemists of America," he said, "gathered here today in the annual meeting of their professional INSTITUTE, extend greetings to the World's Fair. Through the facilities of the B. F. Goodrich Company, and as their guests in the Goodrich Arena, we congratulate the Fair and especially its Science Committee in bringing beautifully to the world's attention the changes in modern life wrought by science. In these changes chemistry plays the leading role. New industries on display before us here are hatched out of test tubes and beakers. From these chemical reactions evolve new textiles, plastics, alloys, fuels, new weapons to combat disease and ill health; from simple chemical discoveries grow the astonishing improvements in autos, aircraft, and thousands of products used in our daily life.

"THE AMERICAN INSTITUTE OF CHEMISTS, gathered here today from over the nation for its annual meeting, salutes you; and today, more than ever, is the chemist proud of his profession."

Announcement

E. I. du Pont de Nemours and Company regret that the souvenir trays which they contributed to the Annual Meeting of THE AMERICAN INSTITUTE OF CHEMISTS became exhausted, due to the unexpectedly large attendance. A new supply of trays has now been prepared and may be obtained by those who attended the meeting but did not get this souvenir, if they again present their cards at the du Pont Exhibit, World's Fair.

Thank You!

THE AMERICAN INSTITUTE OF CHEMISTS acknowledges, with deep appreciation, the courtesy of the following companies which contributed souvenirs for its Annual Meeting on May thirteenth:

Carbide and Carbon Chemical Corporation, E. I. du Pont de Nemours and Company, Adams Apple Products Corporation, Burroughs Wellcome and Company, McKesson and Robbins, Incorporated, Ultramarine Company, Jean Jordeau, Incorporated, Bakon-Yeast, Incorporated, and Shulton, Incorporated.

Unsolved Problems of Natural Science

By **Rudolf Seiden, C.E.**

ALL OVER the world, professional scientists have been puzzling over the answers to questions proposed by the *Svenska Dagblad*, given as follows:

"Which of the gaps in your field of research, to your way of thinking, are most in need of being filled? Which are the most acute and most vital problems? Which of these questions is natural science likely to answer in the near or distant future?"[1]

The answers of these scientists are given in the following paragraphs, grouped according to subject and condensed by our reviewer.

Prophecies concerning the future developments in natural science are hard to make, since not only are entirely unforeseen facts discovered every moment, but also, occasionally, new and revolutionary concepts are brought forth.[2] As to what next concerns the philosophical side of all natural science, it would seem that the completion of a uniform and logical foundation for the new quantum theory of physics and a clarification of the relationships between the concepts of the quantum theory and classical physics are of the greatest importance.[3] The question of the deeper meaning of the quantum-theoretical idea is yet unsolved. The unification of the corpuscular theory and wave hypothesis into a comprehensive system has not yet been successfully accomplished.[4]

The concept of catalysis belongs among those fundamental principles that are assisting in the adaptation and unification of the picture of the natural world as a whole. Its significance and sphere of action stretches from chemistry to biology.[5] Much confusion could be avoided if one could be certain of the boundaries of natural scientific investigation, so elusive are questions ranging from the origin of life to the explanation of the fundamentals of science.[6]

In physics, the exploration of the examples and assumptions in the realm of atomic nuclei stands in the foreground.[7] After carrying through

1. From the *Svenska Dagblad* which published the complete answers and the exposition in the *Chemiker-Zeitung*, 1938, #3, pp. 29-31.
2. M. von Laue; Ejnar Hertzsprung, Leiden.
3. T. Levi-Civita, Rom; W. F. G. Swann, Swarthmore.
4. M. von Laue, Berlin; W. Kossel, Danzig.
5. A. Mittasch, Oppau.
6. S. P. L. Sörensen, Kopenhagen.
7. W. Bothe, Heidelberg; F. G. Donnan, London; O. Hahn, Berlin-Dahlem; A. Sommerfeld, München; P. Jordan, Rostock; H. A. Kramers, Leiden.

and resolving the difficulties encountered in the transmutation of matter so that the process becomes entirely successful, a complete understanding of the structure of atomic nuclei should make it possible to free and control sub-atomic energies.[8]

Cosmic rays stand in a close association with the physics of the elementary building-stone of matter. There still remain unsolved the many questions of their source and their composition.[9] Since the cosmic phenomenon is a higher form of radiation known to astronomers, perhaps even a more important auxiliary than light, the rays may give us an explanation and insight into the occurrances within the mysterious dark nebuli of the universe.[10]

The manufacture of synthetic radio-active elements reveals extraordinary possibilities of further discovery in the physical, chemical, biological, and medical fields.[11]

Neutron-rays have an entirely different biological effect than Röntgen-rays and are of much more value for a definable therapeutic aim than the latter.[12]

Isotopes are likely to become very vital to organic and physiological chemistry, because of their aid to chemists in following a compound through a series of chemical combinations and through the organism itself.[13]

The explanation of super-conductivity provides a nice problem for the theoretical physicist.[14] Also, other remarkable occurrances in the neighborhood of absolute zero arouse the greatest interest; for example, the extraordinarily high thermal-conductivity of liquid helium at a temperature below —219 degrees.[15]

The blanks in our physical knowledge are not very numerous, yet the simple question concerning the geometrical positions of atoms are only answered for gases and solid bodies. The molecular theory of the electrical conductivity of solid bodies remains in its primary stages, even the old acknowledged rigidity of solid bodies and their boundaries has as yet eluded quantitative molecular means of calculation.[16] Probably the liquid state resembles that of a solid body rather than that of a highly condensed gas and behaves, within a small range, exactly like crystalline

8. F. W. Aston, Cambridge.
9. V. F. Hess, Innsbruck.
10. W. Kolhörster, Berlin-Dahlem.
11. O. Hahn, Berlin-Dahlem.
12. E. O. Lawrence, Berkeley.
13. A. Krogh, Copenhagen.
14. R. W. Pohl, Göttingen.
15. W. H. Keesom, Leiden.
16. M. von Laue.

matter.[17] The theoretical explanation of the relationships that make up the picture in respect to mixed crystals is also a veritable problem.[18]

The question of the structure and behavior in motion of our star systems are among the most important problems of astro-physics.[19] The investigation of the radiation of heavenly bodies in the short-wave ultra-violet range would advance astronomical research enormously.[20] An especially vital, and as yet unsolved problem of astro-physics, is the red-displacement in the spectra of the extra-galactic nebuli in relation to distance. Whether the displacement means an expansion of the universe or proceeds from an entirely unknown natural law is as yet unknown.[21]

In meteorology, the means of observation will be further widened through the employing of "radio-transmitters", which are carried up about twelve and a half miles by tiny balloons and continually send out radio signals concerning atmospheric pressure, temperature, and atmospheric moisture as they pass through the various air levels.[22] Practical and thus important weather forecasting would be possible over long periods if the daily alterations of the sun's radiations were better known. Therefore, further observation stations are necessary in waste tropical regions so that accurate measurements of the ultra-violet rays of the sun can be made, with the help of automatic tracings in free balloons at heights above fifteen and a half miles. The marked influence that relatively insignificant fluctuations in the sun's radiation exert on the weather, depends probably on the variations in the ozone content of the atmosphere, as it is restricted through the alterations of the sun's radiation. The experimental verification of these relationships is a particularly difficult problem.[23] Weather forecasting has for some time been more and more dependent on the question of the reaction of ozone on the atmosphere.[24]

One of the immediate problems of physical chemistry is a deeper penetration into the comprehension of those factors that govern the beginning and course of chemical reactions.[25] The mechanism of those chain reactions set off by explosive processes is as yet insufficiently known, wherefore, we cannot control them in a fully satisfactory manner.[26] In the unexplored territory of the chemical reactions in the fluid

17. L. Brillouin, Paris.
18. Lars Vegard, Oslo.
19. O. Bergstrand, Stockholm.
20. W. Grotrian, Potsdam.
21. B. Lindblad, Stockholm; H. N. Russell, Princeton.
22. J. Bjerkness, Bergen.
23. C. G. Abbot, Washington.
24. J. Bjerkness; A. Defant, Berlin.
25. M. Bodenstein, Berlin.
26. M. Bodenstein, Berlin.

state caused by high pressures, one may expect very profound results before long.[27]

Colloidal chemistry, the theories of electrolytic solutions, and kinetic and thermodynamic reactions are in the midst of very rapid development.[28] Research concerning the colloidal state, as to structure and properties of the larger molecules and miscellanies, are of particular importance, because they provide points for the attack of science on the "fortress of life".[29] The foundation of the "macro-molecular" chemistry holds promise, for example, of a deeper insight into the life-function of the chromosome, in which millions or billions of individual atoms are united in infinitely varied ways to form a few giant molecules with specific properties.[30]

In inorganic chemistry, a further development of the research technique with the microscope, Röntgen rays, and electronic radiation in the field of metallurgy is to be desired. The following questions, particularly, are of immediate practical significance; the equilibrium patterns of mixtures of more of the metals, the chemical and mechanical relationships at high temperatures, the light-metal alloys, welding processes, the mechanical usefulness of metals and their wearing properties under various conditions. An elaboration of what goes on in the regions of thermo-electricity and the investigation of the influence of inner cleavage planes are weighty problems of metals.[31] Further X-ray research on the arrangement of atoms ought to make possible even more synthetic products; for example, the preparation of alloys of a better type.[32]

The next most important question for minerology and geology in the foundation of the science of dynamic geology, is a theory of the causes and processes of geological change.[33] With regard to the earth and the process of its formation, we still await an epochmaking inspiration from geological chemistry, though one often draws conclusions from the distribution of the elements in an ore as to the circumstances of its formation and its eventual destiny.[34]

In organic chemistry, interest has centered especially on the discovery of biologically important substances. Protein and enzyme research workers desire above everything else to find a completely valid argument

27. F. G. Donnan, London.
28. J. N. Brönsted, Kopenhagen.
29. F. G. Donnan, London.
30. H. Staudinger, Freiburg.
31. C. Benedicks, Stockholm.
32. W. L. Bragg, Manchester.
33. V. M. Goldschmidt, Oslo.
34. P. Quensel, Stockholm.

for the constitution of some of the most simply constructed proteins and for further advances in the purification and determination of the structure of enzymes.[35] Various cell constitutents necessary for life may already be obtained on a large scale and have been made accessible as remedies, but not nearly enough.[36] There is yet much to be done in the region of the therapeutic effectiveness of organic arsenic-antimony compounds and in the treatment of tropical diseases.[37] Another important problem in need of solution is in the technical aspects of organic chemistry in the production of artificial fibers, synthetic plastics, fatty derivatives, etc., as well as in the utilization of all the raw materials and by-products at one's disposal, for the support of life and household uses.[38] One might say that we are at the beginning of a new technical age in which wood as a raw material plays the most important rôle. Among its uses are artificial silk, cellulose wool, xylose liquid fuels, and so forth.[39] In order that there may be further progress in this field, it is true that the gaps in our knowledge must be filled quickly.[40] It is above all of the greatest economic importance that reforestation be improved through the most purposeful tree-culture according to the most modern methods known from our scientific inheritance.[41]

One of the weightiest of future problems of biochemistry and biology is the investigation of the interplay of biological and chemical functions. Our knowledge in respect to what happens between the primary and final stages of physiological substance and energy changes is as yet full of holes. The rôle of free-acid has been over-estimated. The intermediary substance—energy changes will be controlled far more readily through the chemical properties of hydrogen.[42] The distinction between the reactions that imitate *in vitro* and those which can only be discovered *in vitro* remains one of the primary questions of biochemistry. True, it is possible to prepare synthetically a series of biological substances, but the synthetic methods of the organism are entirely unknown.[43] Vitamin and hormone research has greatly enlarged our knowledge of the nature of the "bio-catalysts", that are effective in reactions within the living

35. A. Kregh, O. Warburg, Berlin-Dahlem.
36. H. von Eulek, Stockholm; A. Westman, Lund.
37. P. Uhlenhuth, Freiburg.
38. H. von Euler, A. F. Enström, Stockholm.
39. E. Hägglund, Stockholm.
40. E. Hägglund, Stockholm.
41. Nilsson-Ehle, Svalöv.
42. T. Thunberg, Lund.
43. E. Widmark, Lund.

cell,[44] but the question as to the source and mode of action of these biocatalysts in individual cases as well as the cause of the successful interaction of innumerable catalyzers in the healthy organism is as yet unanswered. The clarification of the inner structure and function in the system of active principles, as they are produced by the living cell, would be the crowning achievement of natural scientific research.[45] Our laws of nutrition are yet imperfect. Historical review of the nutrition of man in the Stone Age stands in contradiction to the modern vitamin and hormone laws; it would contribute much towards the clarification of these difficulties, if it were possible to compare the nutritional behavior of the still living, isolated, primitive, folk groups by modern biological, chemical, and medical methods.[46]

In the field of medicine, research as to the defense mechanism of the living organism against infection is of utmost urgency, as well as further investigation of the virus illnesses. Progress in the treatment of cancer by means of chemical therapy must be attained, especially in cases where surgery can no longer help.[47] The questions of the cause of irregular growth in cancer and of certain fatal blood diseases require solutions.[48] These, however, assume a much deeper penetration into the secrets of normal growth. This secret in itself provides a sufficiently difficult riddle since it first depends on the harmonious coöperation of unknown factors.[49]

44. A. J. Virtanen, Helsingfors.
45. F. G. Donnan, London.
46. S. Schmidt-Nielsen, Trondheim.
47. P. Uhlenhuth, Freiburg.
48. G. R. Minot, Cambridge.
49. F. Kögl, Utrecht.

Robert J. Moore, President of THE AMERICAN INSTITUTE OF CHEMISTS, addressed the luncheon meeting on June sixth of the Canadian Chemical Convention in London, Ontario. The convention was held from June fifth to June eighth, under the auspices of the Canadian Institute of Chemistry, the Canadian Chemical Association, and the Canadian Section of the Society of Chemical Industry. President Moore brought greetings from THE AMERICAN INSTITUTE OF CHEMISTS and talked on the aims and objectives of our professional organization. Dr. Otto Maas, F.A.I.C., president of the Canadian Institute of Chemistry presided at this luncheon.

Following the luncheon meeting, President Moore spoke on "The Chemist in the Paint and Varnish Industry" before the Industrial and Engineering Section.

The Young Chemist and the Government Service

By **Louis Marshall, F.A.I.C.**

The fifth of a series of articles dealing with the opportunities for the chemist in the Government Service.

The Industrial Farm Products Research Division

THE Industrial Farm Products Research Division has worked out a nitric acid process for separating high grade cellulose from sugarcane bagasse, which is the residue remaining after the juice of the sugarcane has been expressed. The cellulose obtained is of sufficiently high quality to be used as the basic material in the production of rayon. A commercial firm in Hawaii has set up a plant for the production of cellulose by this process.

The Division has a large continuous-process retort for the destructive distillation of farm wastes, such as nut shells, fruit pits, and raisin seeds, in the field laboratory at Ames, Iowa. Tar oils are prepared from waste material, and their value in insecticidal work studied. This is but one of the many fields of investigation carried out by the Division to discover new industrial applications for the by-products of the farm. Indeed, this broad field of research has assumed such great importance that the four regional laboratories were expressly established for the purpose of conducting investigations in it on a vastly greater scale than had heretofore been possible.

One section of the Division is engaged in research work on lignin, a major constituent of wood and crop wastes. The lignin is removed from cellulose in the production of paper pulp and is a waste product of the paper mills. A method for the manufacture of a useful commodity from this material would be welcomed by the industry. The studies of lignin are carried out with this end in view. The section worked out a modification of Wilstatter's fuming hydrochloric acid method for the determination of lignin in plant material. It demonstrated that sulphite liquor, a lignin product which is produced in enormous quantities in paper mills, can be treated with aqueous ammonia under pressure at a temperature of 220 degrees centigrade to produce an organic nitrogenous fertilizer. The latter has been found to be nontoxic to plants and its nitrogen content of approximately eleven per cent is available to them. If no other practical difficulties stand in the way, the product

may find wide uses as a fertilizer material. The publication reporting this work appears in the *Journal of Agricultural Research*, volume 53, page 209.

There is another section which devotes its time to industrial fermentations, studying, among other things, the fermentative production of dextrolactic acid from glucose by selected strains of yeast. Lactic acid has an asymetric carbon atom, and by suitable fermentation of glucose, it is possible to obtain that form of the acid which rotates the plane of polarized light to the right. The lactic acid which is prepared synthetically is, of course, always optically inactive, consisting of equal parts of the dextro and levo forms. The complex factors which are involved in the production by fermentation of other organic acids, as gluconic and citric, are being studied. The work is of great practical importance. This section requires the services not only of chemists, but also of mycologists or specialists in fungi.

In connection with its work on weed-killers, the Division set up a semi-industrial electrochemical plant for the manufacture of sodium chlorate. This salt is an important herbicide, and the intention is to make it available to farmers at low cost.

Another investigation carried out by the Industrial Farm Products Division has dealt with the mildew-proofing of cotton fabrics designed for outdoor use. It was found that precipitation of chromium hydroxide on cotton duck imparted little or no mildew resistance. On the other hand, the precipitation of copper compounds alone or in combination with chromium and iron produced a fabric which showed considerable resistance to the development of mildew.

A different field of research has been concerned with the leather industry. Experiments have been carried out to discover which antiseptic chemicals may be added, in very small quantities, to salt to make the latter more effective as a preservative for hides and skins. A solution of this problem would help to reduce an annual loss of about ten million dollars from spoilage and waste of hides due to poor curing. A great deal of experimental work has led to the conclusion that salt, containing 0.5 per cent sodium silicofluoride and 0.1 per cent paranitrophenol, constituted an efficient preservative. One of the discoveries of the section dealing with leather and tanning materials was that the rotting of leather bookbindings may be prevented by the substitution of chrome-tanned for vegetable tanned leathers. The United States Government Printing Office has utilized this knowledge by buying, instead of the usual vegetable tanned leather, a supply of full chrome-tanned sheepskin leather for bookbinding purposes.

As stated before, the type of work which is carried out by the Industrial Farm Products Division will be greatly expanded when the four regional laboratories begin to function. The problem of finding the means to utilize agricultural products for non-food purposes is one of vast economic importance. Its solution will provide profitable outlets for those products now occurring in surplus amounts. It is noteworthy that, although scientists of varying specialties will work in this field, the men who have been chosen to direct the regional laboratories are all chemists; eloquent proof of the reliance placed upon their profession as a weapon in attacking the problems of modern agriculture.

The Naval Stores Research Division

The Naval Stores Research Division conducts investigations designed to bring to light new uses for pine gum products. The time-honored commodities obtained from pine gum have, up to now, been turpentine and rosin. These products are of vast commercial importance, rosin being used in the manufacture of linoleum and dark varnishes, in paper sizing, and in soap making; turpentine, in the manufacture of paints, varnishes, and lacquers, and as a solvent for other purposes.

The Division has recently obtained from pine gum a number of other liquid and solid fractions which seem to offer possibilities of commercial use. One of the fractions obtained is light colored, rosin-like, and contains a large proportion of stable acids like pimaric. Its properties may make it more valuable than ordinary rosin for the manufacture of high grade soaps. Other fractions isolated from pine gum may be useful in varnish making and as paper size.

One of the commercially important problems investigated by the Division, was the discoloration which turpentine undergoes when it is stored in the usual iron tanks for a year or more. This discoloration, which lowers the value of the turpentine, is due to the action of the iron on it. Experiments showed, however, that if the product were water free, it could be stored in full closed containers for at least one and one-half years without appreciable change. It was also shown that hydrated oxalic acid, suspended by a cotton bag in turpentine containing free water, protected the turpentine from discoloration when it was stored in the iron container. The feasibility of employing this method on a larger scale is to be determined. One of the questions which must be answered before the method is recommended is whether or not the oxalic acid contaminates the turpentine.

In its efforts to find new uses for rosin, the Division is conducting researches to determine the value of copper and other metallic resinates

as mildew-proofing agents for cotton fabrics. The possibility of using resinates as carriers of insecticidal metallic salts is also being investigated in coöperation with other bureaus of the Department of Agriculture. Copper salts of rosin acids have been observed to exert a stimulating effect on plant growth. This rather unexpected phenomenon is being studied further in coöperation with the Bureau of Plant Industry.

The Protein and Nutrition Research Division

The Protein and Nutrition Research Division has gained a fine reputation for the quality of its biochemical work on proteins, and for its investigations of the problems of nutrition. Some time ago, the Division reported that the treatment of casein with dilute alkali, the agent commonly used for its preparation for scientific purposes, resulted in the destruction of cystine. The latter is a nutritionally essential amino acid and therefore one of the most important constituents of the casein. The fact was thus brought out that the use of casein, "purified" with dilute alkali, necessarily led to erroneous conclusions in feeding tests.

Studies have been made on the digestibility of casein which is considered to be a complete protein, since it appears to contain the nutritionally essential amino acids. It is used to supply the protein requirements in basal rations for feeding experiments in vitamin work, and as a standard of comparison in determining the nutritive value of different protein foods. It was shown that casein, when digested with the enzyme trypsin in slightly alkaline medium, liberates cystine, which however is partly destroyed by the alkali. When the digestion of casein with trypsin was carried out in a slightly acid medium of pH 6.8, the cystine was liberated more gradually. It was not destroyed in the acid medium, however, and its full amount could be recovered. It was also found that the digestion of casein was not as complete when a different enzyme, pepsin, was employed. A study of the action of alkali on cystine disclosed that when trypsin was present in the mixture, the destruction of the amino acid was three times greater than when trypsin was absent. It was also shown that the destruction of cystine was greater with sodium hydroxide than with sodium carbonate. All these and other experimental data on proteins are steps in the process of gaining information regarding their digestibility when eaten by animals. Although the experiments are carried out *in vitro*, they are carefully controlled and the comparative results find practical application in animal nutrition work. One of the recent contributions of the Division appeared in the *Proceedings of the American Society of Biological Chemists*. It dealt with the researches on the digestibility of proteins *in vitro*, and gave

the rate of liberation of cystine on the tryptic digestion of casein. It also presented experimental data regarding the stability of cystine in digestion mixtures at different pH values.

The work of the Division on proteins and nutrition, led to the novel observation that those amino acids are nutritionally essential which, in metabolism, are nonsugar-forming. The amino acids which are sugar formers are dispensable in nutrition with the possible exception of those containing sulphur.

The chemists of the Division devoted some time to working out a method for the determination of total amino acids in flour. The procedure of hydrolyzing the protein directly cannot be utilized with food materials like flour because the starch and other nonprotein substances present decompose the amino acids, cystine, tryptophane, and histidine, during the hydrolosis. The direct hydrolosis method can be applied only to purified proteins. The procedure adopted was to remove quantitatively the nitrogenous compounds by treating the flour with suitable solvents. The extracts obtained were then hydrolyzed to their amino acids. Analyses, by this method, of white commercial wheat flour and whole wheat flour, revealed that the percentage of cystine, tryptophane, tyrosine, lysine, and arginine were larger in the former.

One of the problems on which the Division is engaged, the study of toxic organic selenium compounds, is of outstanding importance to agriculture and to public health. These compounds are found in plants grown on seleniferous soils. For example, the protein of wheat grown on such soil contains a selenium compound, and experimental work on its isolation and identification is continuing. The selenium appears to be in stable combination; either a ring structure or attached to several carbon atoms in its most highly oxidized form. The question has not yet been answered, but further experimental work will probably elucidate the structural formula of the compound.

One of the methods employed by the investigators was to hydrolyze with sulphuric acid the gluten obtained from toxic wheat. The resulting mixture of amino acids was fractionated and that portion which contained most of the selenium together with leucine and phenylalanine was treated with mercuric chloride. The precipitate which formed contained practically all the selenium. The separation of the selenium compound from the mercury has not as yet been accomplished. One publication reporting this work appears in volume 14, page 130, of *Cereal Chemistry*.

Selenium occupies a very prominent position in soil chemistry of the

present day because it has been found to be injurious to humans and to animals when taken in sufficient quantity. After many years of investigation, selenium was found to be the cause of the western states' livestock disabilities, like alkali disease and blind staggers. The element is widely distributed throughout the soils of the world, and the extent of the toxicity of vegetation grown on such soils must be carefully determined. The Bureau of Chemistry and Soils is, in fact, engaged in determining the extent of the presence of selenium in the principal agricultural soils of the United States, Puerto Rico, and Hawaii. From present knowledge, it appears that the element presents a problem in those seleniferous soils which are not exposed to much rainfall. Where the rainfall is heavy, the selenium compounds are removed by percolation through the soil. It may be mentioned in this connection that the findings of the United States Public Health Service indicate that humans are not likely to get enough selenium in their ordinary diets to cause toxicity.

The Chemical Engineering Research Division

One of the tasks of the Chemical Engineering Research Division is the study of agricultural dust explosions. In this respect, its work is analogous to the Bureau of Mines under whose auspices researches on industrial dust explosions are carried out. Agricultural dust explosions happen too frequently throughout the country. In one year these disasters caused the death of twenty persons and the injury of fifty, besides being responsible for property damage of about one million dollars.

The menace of the explosions lies not only in the destruction of life and property, but also in the fact that one never knows when they will take place. The conditions which must be obtained before an explosion of organic dust clouds occurs have not been fully determined, and researches directed toward the removal of this ever-present danger must continue. The various explosions which have occurred recently throughout the country have each been investigated and found to be caused by grain dust, soybean dust, aluminum powder, fertilizer dust, wood dust, or in one case, hexane vapor. The latter was the cause of a serious explosion in a soybean processing plant in Chicago. In this plant the soybeans were treated to obtain oil, meal, and other products. The oil was extracted from the ground beans by means of the inflammable solvent hexane. An ignition of dust clouds present around the grinding machinery flashed to an adjoining section where hexane vapors were present, and the explosion which resulted caused the death of eleven men and the injury of forty-five.

In order to learn more about the causes of such disasters, the Division operates a test structure at the experimental farm at Arlington, Virginia; where controlled experimental dust explosions can be produced. A great deal of information has already been obtained by this method, and although the knowledge of the causes and prevention of dust explosions is far from complete, enough is known about them to conduct educational work on means for their prevention. The Bureau of Chemistry and Soils has a staff of experts who deliver lectures before suitable audiences on methods of dust explosion prevention. These lectures are illustrated by visual demonstrations such as lantern slides and motion pictures. They have been presented before important groups like the National Safety Congress, the National Fire Protection Association, and the Society of Grain Elevator Superintendents of North America. Appropriate trade journals give wide circulation to the lessons learned at these meetings. In addition, conferences are held with representatives of manufacturing firms on putting into practical application the results of the researches of the Bureau on the prevention of dust explosions. An article which presents an interesting discussion of the problem was published in a recent issue of *The Scientific American.* It is entitled, "When Dust Goes Up in Smoke".

The study of farm fires is a related problem to which the Division is directing its attention. The tendency of hay to ignite spontaneously is being studied. It was found that one lot of chopped hay, principally alfalfa, had a temperature of ninety degrees centigrade below its surface, seven days after storing. The observed effects of the storage were, not only a thorough drying of the hay, but also a browning of the central portion which had lost much of its feeding value. Preliminary studies have led to the tentative conclusion that the spontaneous ignition of hay may be due to the oxidation of very unstable unsaturated organic compounds formed in the hay by micro-organisms.

The Fertilizer Research Division

The Fertilizer Research Division investigates problems of fundamental importance to the agricultural life of the nation. A thorough study of fertilizers requires all the tools of modern physical chemistry, X-ray analysis, crystallography and spectro-analysis, as well as a knowledge of the action of catalysts, those *"agents provocateur"*, of chemistry. The early work of the Division on the search for efficient catalysts for the production of ammonia from mixtures of nitrogen and hydrogen met with success. The synthetic ammonia industry in the United States is today firmly established.

The present studies of the Division on the subject of catalysts have been extended with the object of acquiring an understanding of the fundamental principles underlying catalytic action. Catalysis plays an important rôle in the manufacture of synthetic fertilizers, and a fuller knowledge of the principles governing catalysis would no doubt lead to the production of better fertilizers at less cost. The titles of some of the recent publications of the division on the subject of catalysis give a clue to the contents and caliber of the work. One article appearing in volume 57, page 1631, of the *Journal of the American Chemical Society* is entitled, "The Adsorption of Hydrogen by Iron Synthetic Ammonia Catalyst". Another appearing in the same volume of the *Journal*, page 2732, is entitled, "The application of Polanyi's Potential Theory to the Van der Waal's Adsorption of Gases on Iron Synthetic Ammonia Catalysts". A third article, appearing in the *Transactions of the Third International Congress of Soil Science*, is entitled, "The Specific Catalytic Role of Molybdenum and Vanadium in Nitrogen Fixation and Amide Utilization by Azobacter".

The Fertilizer Research Division has a section devoted to X-ray and crystallography. Recently, it studied by means of X-ray diffraction analysis, the molecular structure of alunite, which is a natural hydrated basic potassium alum having the formula $Al_2(SO_4)_3$, K_2SO_4, $2Al_2O_3$, $8H_2O$. Also, the effects of X-rays on corn seeds and tobacco plants were determined, this work being carried out in coöperation with the Bureau of Plant Industry.

An investigation of the reaction N_2O_3 plus H_2O to give $2HNO_2$, revealed that the heat involved in the formation of the two gram molecules of nitrous acid exceeded 10,000 calories. This was determined by means of the ultraviolet absorption spectra. In connection with the work, it was found that nitrous acid in the gaseous phase can be precisely determined by an optical method.

As a result of extended research work on magnesium compounds for fertilizer materials, the synthesis of new compounds of urea with magnesium sulphate and magnesium nitrate has been accomplished. These high-nitrogen compounds may be found not to have the undesirable properties of urea itself, and since they contain a secondary plant nutrient, magnesium, they may become very desirable for fertilizer use. In this connection, it may be stated that the division produces new and promising fertilizer materials in semi-commercial quantities in

order to demonstrate to the industry the feasibility of making them on a large scale.

After the fertilizers have been prepared, and are ready to be sold, it is necessary that methods be standardized for their analysis so that the quality can be determined. To this end, the Fertilizer Research Division coöperates with the Association of Official Agricultural Chemists in devising methods of analysis. The work is very complex because most of the fertilizers which are sold to farmers are mixtures, and the constituents tend to segregate, thus making it difficult to obtain a true average sample. The segregation of the various materials in the fertilizer is also troublesome from another point of view. It tends to prevent uniformity in the fertilization of the soil by the farmer.

Necessary constituents present in one part of the soil will be lacking in another. In order to overcome this defect, the division worked out a method of granulating a particular fertilizer so that each grain contains the different fertilizer elements in the same proportion. The method has been found to be applicable to the granulation of any commercial fertilizer mixture, and it also can be made to yield any desired size of grain. Here again is illustrated the intensely practical nature of the work of the Department of Agriculture. The problems of the farm are tackled with all the tools of modern physical chemistry, thermodynamics, statistical analysis, chemistry, crystallography, and other scientific methods which give promise of yielding a solution of the matters investigated. The consumer as well as the farmer ultimately reaps the harvest of this fine work. The researches of the Department on fertilizers are particularly important since without their use, large scale planting is almost always unsuccessful.

Soil Chemistry and Physics Research Division

One of the activities of the Soil Chemistry and Physics Research Division is a study of the occurrence and distribution of selenium in the soils of the United States. *Technical Bulletin* 482 of the Department of Agriculture, published by the Division, contains the first detailed report on this subject, and is well worth reading because of the great importance attached to this element in present day soil chemistry. Further discussions of this subject are presented in *Technical Bulletins* 530 and 601. The division studies the extent of the presence of the toxic element in the soils of the nation. The determination of the structural form in which selenium occurs and its relationship to other constituents of plants or plant products is attempted by the Protein and Nutrition Research Division.

Investigations in soil chemistry have made it increasingly apparent that trace elements, those generally present in soils to the extent of only a few parts per million, and always overlooked in an ordinary analysis, are important in plant nutrition and even have their effects upon the food value of agricultural products. The division is working on the project of determining quantitatively the proportions of such elements as arsenic, copper, cobalt, nickel, zinc, barium, chromium, and vanadium in soils. The influences of these and other more commonly occurring elements upon soil behavior are closely studied. It is interesting to recall that some of the pioneer workers in agricultural chemistry felt intuitively that a study of only the common elements in soils was of limited value and was likely to lead to grossly inaccurate conclusions when used as a basis in planning a course of action in agriculture. They sensed that which later was actually proven to be true, that elements occurring only in traces exerted influences upon the soil and its products which could not be neglected.

Much of the work of the division involves investigations of inorganic soil colloids which are the active components of all soils. This field of research requires the services of physicists as well as chemists.

The Bureau of Chemistry and Soils employs a large staff of chemists to carry on its diversified activities. There are eleven principal chemists, thirty-one senior chemists, fifteen chemists, forty-two associate chemists, thirty-five assistant chemists, and twenty-one junior chemists, making a total of one hundred and fifty-five. These figures are, of course, subject to constant change through additions of personnel, transfers, resignations, etc. In addition, there are many other professional employees who are classified as physicists, engineers, toxicologists, bacteriologists, and so on. There are also many technical employees doing work of a subordinate nature, who hold ratings in the various grades of the Sub-professional Service.

Invitation

Members of THE AMERICAN INSTITUTE OF CHEMISTS are cordially invited to visit the Owens-Corning Fiberglas Corporation exhibit in the Glass Center Building at the World's Fair by Mr. Jan S. Irvine, director of the Fiberglas exhibit.

A complete Fiberglas manufacturing unit has been installed in the exhibit. A fabric loom is operated to show how the threads spun from molten glass are woven into Fiberglas textiles. Special exhibits will illustrate the applications of Fiberglas textiles in the chemical industry.

Opportunities for Women Chemists

By **M. R. Bhagwat, F.A.I.C.**

A SYMPOSIUM was held on April 15, 1939, under the auspices of Connecticut College and the Institute of Women's Professional Relations at New London, Connecticut, to discuss opportunities for women chemists. Dr. Emma P. Carr, Professor of Chemistry, Mount Holyoke College, presided at the morning session. Miss Ruth O'Brien, Bureau of Home Economics, Department of Agriculture, and Dr. William J. Hale, research consultant, presented papers. Dr. Robert E. Rose, technical director, E. I. duPont de Nemours & Company, was unable to attend and his paper was read by Dr. Carr.

During the afternoon session, Dr. Esther Batchelder, professor of home economics, Rhode Island State College, presided. Dr. Mary Swartz Rose, Teachers College, Columbia University; Dr. Walter S. Landis, vice-president American Cyanamid Company; and Dr. Hans T. Clarke, College of Physicians and Surgeons, Columbia University, gave their views regarding possibilities of employment for women chemists. Dr. Wanda K. Farr, Boyce Thompson Institute, concluded the session with a summary of the thoughts presented.

The following important points were brought out which should be of interest to women chemists:

1. City, state and federal governments in their various departments, such as Education, Health, Sanitation, Home Economics, etc., employ women chemists. It was suggested that candidates should keep in touch with civil service announcements and where no preference of sex is mentioned, an attempt should be made to get on the various qualifying lists.

2. Recent graduates would find a knowledge of languages, typing, stenography, or other supplementary office routine helpful in securing employment.

3. Post-graduate students have better opportunities to enter into fundamental research in endowed institutions and teaching. The field most desirable for women chemists would be food, cosmetics, biochemistry, and certain divisions of textile chemistry.

4. The field of nutrition gives unlimited opportunities for women chemists as technicians, organizers, or managers.

5. Women trained in chemistry and having suitable qualifications could find employment as librarians, translators, literature abstracters, editorial workers, and office assistants to chemical executives.

6. Due to physical limitations, women will find it difficult to secure employment in industrial laboratories, preference usually being given to men.

7. Continuance or discontinuance of employment due to matrimony was considered an important factor in the cases of women employed in the industry. This may not prove a serious factor when women are employed in teaching, pure research, or certain divisions of government service.

Although possessing an adequate knowledge of chemistry, every individual will need sufficient instruction in the technique of securing employment. Continuance of employment will depend upon the breadth of education, culture, and ability to prove useful to the employer.

The chemical profession is deeply indebted to Dr. Katharine Blunt, President of Connecticut College, and Mrs. Chase Going Woodhouse, director, Institute of Women's Professional Relations, and their associates, for arranging this interesting and important meeting.

Shortage of Engineers in Germany

A survey made in Germany recently shows a potential shortage of engineers, according to *Combustion* (*New York*), which reports a discussion in *Zeitschrift des Vereines deutscher Ingenieure*. The number of engineering students in the German technical high schools is about forty-four per cent of that in 1928 and in the universities about fifty-two per cent. On the other hand, the figures for medicine are one hundred and seventy-nine per cent, for theology one hundred and sixty-seven per cent and for political economy sixty-five per cent. This leads to the assumption that there is a trend toward preparation for those callings which offer an independent living.

In 1933 there were approximately 250,000 engineers of all kinds in Germany. Yearly replacements are figured normally at 4000 to cover deaths, retirements, etc., although this figure should increase because many older engineers are still in active service because of the shortage of younger men. Added to this are the requirements to take care of technological advancements, estimated at 6000 engineers, making a total yearly requirement of 10,000 engineers. The present output of the engineering schools will fall far short of meeting this demand.

In an effort to induce more young men to take up the study of engineering, financial assistance for those lacking the necessary funds is being offered by manufacturing groups, the VDI, and a student works program of the government.

Charles R. Ely

THE AMERICAN INSTITUTE OF CHEMISTS deeply regrets the death of Charles R. Ely, F.A.I.C., who passed away February 22, 1939. He was born at Columbus, Ohio, February 20, 1870. Throughout his professional life, Dr. Ely was deeply interested in the education of the deaf.

Dr. Ely was granted the A.B. degree by Yale University in 1891; the M.A. from Gallaudet College in 1892; the A.M. from Yale University in 1897; and the Ph.D. from Columbian University (now George Washington University) in 1900.

Following his graduation, Dr. Ely was an instructor at Gallaudet College, a part of Columbia Institute for the Deaf, until 1912. From 1912 to 1913 he was principal at the Maryland Institute for the Deaf and in 1913 he returned to Gallaudet College, attaining the rank of vice-president and professor of Natural Science, where he remained until his death. He was the author of various papers and articles on entomological subjects, and on education for the deaf.

Arthur Edward Hill

On March 16, 1939, American chemistry lost by the death of Professor Arthur Edward Hill, F.A.I.C., a man loved as a teacher for his kindness, his friendship and his benevolence, and respected in research for the quality and the quantity of his contributions to chemical knowledge.

Professor Hill's extraordinary aptitude as a chemist and as an administrator has been recognized in many ways. He had been chairman of the Chemistry Department at New York University, acting dean of University College, chairman of the New York Section of the American Chemical Society, Councilor of the American Chemical Society, chairman of the Division of Physical and Inorganic Chemistry, and associate editor of the *Journal of the American Chemical Society*.

Dr. Hill received his A.B. and his A.M. degrees at New York University and his Ph.D. under Gatterman at Freiburg, Germany, in 1903. In 1904 he returned to his *alma mater* as an instructor, and thereafter rose steadily through the various academic ranks, succeeding Professor Arthur B. Lamb as head of the department. He served in this capacity until his death. Meanwhile, he was also professor of chemistry at New Jersey College of Pharmacy (1906-1919), and during the

war years he was associated with the Chemical Warfare Service at Washington, where he performed and directed valuable investigations on protection against mustard gas. Twice, in 1932-3 and in 1935-6, he acted as dean of University College. Each time, he filled the office with extraordinary ability and, each time, relinquished it with joy that he might get back to his laboratory and to his students.

His contributions to chemical literature comprise over fifty articles and books. He was the first to publish results showing the inconstancy of the classical solubility product. His first work on three component systems is already a classic in chemical literature; the work on the distribution of silver perchlorate between organic solvents and water was early cited as evidence for complete dissociation of salts in water. With Professor M. A. Rosanoff, he developed the modern modification of the Volhard analysis for chlorides. His work includes many reports on other methods of analysis, and on solubility relationships and applications of the phase rule in the study of heterogeneous systems. In these fields his eminence was unquestioned. He contributed a chapter to the *Treatise on Physical Chemistry*, edited by Professor H. S. Taylor, and was contributing editor to the *International Critical Tables*.

In addition to membership in the American Chemical Society and THE AMERICAN INSTITUTE OF CHEMISTS, Professor Hill was also a Fellow of the American Association for the Advancement of Science, and a member of Phi Beta Kappa, Sigma Xi, Phi Lambda Upsilon, Delta Phi, Iota Alpha, The Chemists' Club, and Deutsche Chemische Gesellschaft.

The influence Dr. Hill exerted on the initiation and on the growth and development of research at his *alma mater* is freely acknowleged by his associates. His extraordinary devotion to his work and to his students, to honesty and to scholarship will be remembered for a long time by the many who have felt the influence of his personality.

It has always seemed to me that affiliation with THE AMERICAN INSTITUTE OF CHEMISTS is more than merely the "joining of another organization". It ties in so closely with the welfare and aims of our practice, it is so intimately connected with the maintenance of its high standards and integrity, that it becomes as necessary to our professional life as is the American Chemical Society to our scientific progress. —Robert J. Moore.

Reports to the Annual Meeting of the American Institute of Chemists

For the year ending April 30, 1939.

Report of the Secretary

I am pleased to submit this report of activities of THE AMERICAN OF INSTITUTE OF CHEMISTS during the season of 1938-1939.

The National Council held nine meetings during the year with an average attendance of nine councilors.

The following actions upon the membership were taken:

Elections

Fellows	142
Associates	12
Juniors	42
Students	3
Total	199

Loss of Membership
Resignations

Fellows	18
Associates	2
Juniors	3
Students	1
Total	24
Dropped	0

Deceased

Honorary Members	3
Fellows	10
Total	13

Reinstated

Fellows	1
Total Loss	36
Net Increase	163

Actions

Associates raised to Fellows	1
Juniors raised to Fellows	2

Total Membership

	May 1, 1938	*May 1,1939*
Honorary	16	7
Life	3	3
Fellows	1083	1201
Associates	95	104
Juniors	98	135
Students	6	8
	1295	1458

We have today the largest membership in the history of the INSTITUTE, and it is most satisfactory to note that, notwithstanding the continued unemployment situation in the chemical professional field, the increase in membership during the present year was only seven less than in the previous year.

The reports of the president, the the treasurer, the chapters, the various committees, and the editor of THE CHEMIST will indicate the wide activities of the INSTITUTE and need not be repeated in this report.

It is again a great pleasure to me to thus publically express my appreciation of the valuable and loyal service of my assistant, Miss V. F. Kimball, both in her assistance to me as secretary and in her capable capacity as editor of THE CHEMIST.

HOWARD S. NEIMAN, *Secretary*

Report of the Committee on Patents

A progress report for this committee was presented by the chairman, Dr. Gilbert E. Seil. A complete report will be prepared for the Fall meeting of the Council, and will appear in a later issue of THE CHEMIST.

Treasurer's Report

Schedule of Income and Expenses

For the year ending April 30, 1939.

INCOME		
Members Dues, 1938-1939		$5,689.10
Less Reserve for Chapter Refunds		355.97
Net Income From Dues		$5,333.13
The Chemist Publication		
Income from Advertising	$ 644.05	
Income from Subscriptions	1,897.30	
Gross Income	$2,541.35	
Less Cost of Publishing	2,906.07	
Net Loss on The Chemist	364.72	
Total Income for Year		$4,968.41
EXPENSES		
Office Rent		$ 600.00
Office Light		27.84
Office Salaries		2,150.75
Social Security Taxes		21.51
Other Taxes		1.00
Badges, Medals, Tokens		44.61
Council Meeting Expenses		79.80
Membership Expenses		359.68
Telephone and Telegraph		127.07
Postage		233.83
Stationery and Printing		326.25
Accounting		100.00
Net Banquet Cost		13.85
Chemist Advisory Council Contributions		111.99
Reserve for Delinquent Dues, Written Off		160.50
Christmas Bonuses		35.00
Interest on Note		5.00
Licensing Committee Expense		123.96
Secretary Expense		58.37
General Expenses		0.24
Total Expenses for Year		$4,581.25
NET INCOME FOR YEAR ENDED APRIL 30, 1939		$ 387.16

Auditor's Report, 1938-1939

THE AMERICAN INSTITUTE OF CHEMISTS
233 Broadway
New York City, N. Y.

Gentlemen:

Pursuant to your instructions, I have audited your books and records for the fiscal year ended April 30, 1939, and submit herewith a Balance Sheet as at that date together with a statement of Income and Expenses for the year and a statement of Cash Receipts and Disbursements.

Cash in the Public National Bank was verified by reconciliation with the bank statement and satisfactory vouchers were presented for all items under audit. Dues receivable from members for the years from 1935 to 1939 amounts to $1404.00 against which there was set up an arbitrary reserve of 50 per cent for bad and delinquent accounts.

The excess of income over expenses for the year amounted to $387.16. This compares with an income of $1654.79 for the previous year. The difference

was occasioned mainly by the fact that there were special contributions of $1112.00 in the previous year and that the CHEMIST publication showed an income of $590.68 last year as against a loss of $364.72 for this year. The actual cost of publishing the CHEMIST for both years was almost equal but the income from advertising and subscriptions fell off about $800.00 this year.

The Surplus account on April 30, 1939, was $2120.09 and represents an increase of $387.16 for the year. This increase is the amount as shown in the schedule of income and expenses.

Your total membership increased from 1295 on April 30, 1938 to 1458 on April 30, 1939 as indicated on the schedule of membership changes.

In my opinion, the Balance Sheet submitted herewith, and the related statements of Income and Expenses together with accompanying schedules, correctly present the financial position of THE AMERICAN INSTITUTE OF CHEMISTS on April 30, 1939, and are in accordance with the books and records.

Respectfully submitted,

JACOB A. LICHTENFELD,
Certified Public Accountant

Report of the Committee on Unemployment, 1938-1939

During the past year, the Committee on Unemployment of THE AMERICAN INSTITUTE OF CHEMISTS has devoted its entire attention to the activities of Chemist Advisory Council, Inc. The members of the committee attended meetings of the national council of the INSTITUTE and reported the progress made by this new organization in assisting unemployed chemists and chemical engineers. Several articles covering the work of the Council, giving statistical and other information, were published in THE CHEMIST for the information of the members of THE AMERICAN INSTITUTE OF CHEMISTS.

The Council is rendering necessary and humane services to the chemical profession without duplicating the activities of any other existing organizations and has successfuly demonstrated the usefulness of this endeavor during the past fifteen months of active efforts in bettering the lives of chemists and chemical engineers.

The members of THE AMERICAN INSTITUTE OF CHEMISTS are earnestly requested to extend their support in maintaining this organization. Small contributions from a large number will yield the required funds without putting the burden on any groups. It is hoped that every member of the INSTITUTE will give his most earnest consideration to this worthy cause.

M. R. BHAGWAT

Progress Report of the Contact Committee for the Chemist Advisory Council

In an effort to disseminate information concerning the nation-wide character of the Chemist Advisory Council and to increase its effectiveness, your committee is making a survey of existing agencies and fostering the organization of new ones to co-operate with the Council. The response has been very encouraging.

ROSS A. BAKER, *Chairman*

Annual Report of the Committee on Licensure, 1938-1939

This committee, being one of those committees which had regularly been appointed by the INSTITUTE over a period of years, probably did not conceive that there would be any immediate need for its active services when appointed several months ago. Licensure had long been a subject under discussion in the Council and the pages of THE CHEMIST, the INSTITUTE journal. Several times proposed model acts to create a system of licensure had been prepared by other committees but none of these had finally been accepted by the Council.

Then during the year, the startling announcement was made by the Pennsylvania Board of Medical Licensure, that to examine a sample of urine constituted the practice of medicine, followed by the equally self-indicting statement, if true, that the average physician did not possess the ability to interpret such reports. The chairman of your committee attended a conference with the Pennsylvania attorney general upon the subject. Later a brief was filed with him in defense of the chemist on behalf of the American Chemical Society.

October found a conference called in Hot Springs, Arkansas, prior to the A. P. H. A. meeting, at the invitation of the Surgeon General of the United States of America. A committee report, which now appears to have been fully premeditated, was presented to the conference. This report was so worded that only physicians would be recognized as being competent to direct laboratories in which serological tests might be performed. This report was defeated upon the floor.

That many encroachments were being planned against the chemist, and some actually placed in effect, was quite evident. Several states had already passed restrictive legislation regulating the performance of certain tests, other states through their Departments of Health, usually under control of the physician, were attempting to enforce medical direction of all clinical chemistry.

This general situation, with a specific request from a group of chemists in the employ of New York State, prompted the Council of THE AMERICAN INSTITUTE OF CHEMISTS to direct the committee on Licensure to prepare immediately a proposed bill to license chemists, that their professional status might be definitely understood.

The members of the Committee first studied prior drafts of proposed legislation, then arranged for an initial conference upon the subject. To this conference there was invited the chairman of each section of the American Chemical Society located within the State of New York. While no obligation rested upon the committee to extend such an invitation, the fact that the matter was of state wide interest to all chemists prompted them to seek such advice and coöperation. Three meetings of this enlarged committee were held all in New York City. In each instance, Dr. W. W. Winship, Chairman of the New York City Section of the American Chemical Society attended and contributed both critically and in a concrete manner. The Committee is fully appreciative of this help.

As a result of these several meetings, a "Proposed Draft of an Amendment to the Education Law of New York State" was proposed. A final Committee meeting was called to consider this draft, copies of which were sent to all who had previously received notices of the Committee meetings. At

this meeting held prior to the regular Council Meeting of the INSTITUTE, representatives of the Ithaca and Schenectady sections of the American Chemical Society appeared and objected to a number of provisions in the proposed Act. Up to this time there had not been present any representatives of the other sections of the A. C. S. Mr. Wm. S. Murray, a practicing chemist and also the Chairman of the New York State Republican Committee, was present by invitation.

Upon request of the Licensure Committee, the Council again fully considered the subject and directed the Committee to proceed.

Through the kindness of Mr. Murray, Dr. Snell and your chairman obtained a conference with Dr. Thomas J. Mangan, Chancellor; Dr. William J. Walker, Vice-chancellor, and Dr. Roland B. Woodward, all of the New York Regents. With them was discussed the need for such legislation. By them we were referred to Mr. Heisler and Mr. Mangan of the New York State Department of Education. These latter gentlemen reviewed our draft and suggested changes which would make it more readily workable and in conformity with the thoughts of the department in regard to enforcement details.

A final draft was released March 24, 1939, which can best be summarized by the proposed brief which was to accompany the act:

> "The practice of professional chemistry is, at present, unregulated. It is bound on one side by the professional engineer who is licensed. It is bound on the other side by the practice of medicine and of pharmacy, both of which are licensed. There is no hindrance at the present time to any individual's claiming to be a properly qualified chemist and offering his services to the public in general.
>
> "This proposed amendment to the education law of New York State is the outgrowth of several years consideration. The legislation is designed to require licensing of all who hold themselves out to serve the public in the practice of professional chemistry. The corporation, company or individual employer can as a rule, being acquainted with their own needs and able to judge the ability and capacity of their employees, select men properly trained in chemistry and fitted to their own particular requirements. When however, the small manufacturer or the individual requires such service, they must by necessity turn their trust to one who practices generally, either as a consultant or as the proprietor of a laboratory, the services of which are available generally.
>
> "The extent to which such trust must be placed is neither appreciated by the public who has not the training nor judgment to evaluate competency or service, nor by those in the profession who are shrouded in industrial or research laboratories where competency is daily open to scrutiny. The consultant will, if he has his own and his client's interest at heart, refrain from engaging in fields in which he is not adequately versed. Likewise, those men who principally furnish laboratory service will not undertake the examination of materials or products unless they are adequately equipped with the necessary physical and mental tools.
>
> "The relationship of either type of service may, and does seriously

involve the safety and health of all. Upon expert analysis and competent opinion depends the safety of structural materials, such as concrete, steel or iron, the health of many an individual, family or community, when the examination of water or important items of food are involved, as well as the recovery from the ravages of disease or the relief from its associated distress.

"It is evident that if construction materials are submitted to a chemist to pass on their quality, there should be some basis for establishment of the competency of that chemist. If not properly qualified, he may either cause a substantial loss by reporting materials unsatisfactory which are, in fact, satisfactory, or endanger life by reporting materials as satisfactory when they are, in fact, unsatisfactory.

"Food and water, the very foundation of our continued health, must be adequately supervised, both as to quality and freedom from injurious materials. The established manufacturer or carefully regulated public or private water purveyors maintain constant and adequate control. The individual or small manufacturer must seek the services of those practicing as professional chemists to insure that safety which is necessary.

"The trust of the patient in the physician who prescribes and in the pharmacist who compounds, should not be endangered by the analyst who controls the uniformity, purity and accuracy of the medicating agents. Many a small pharmaceutical manufacturer, though maintaining adequate manufacturing control, through the supervision of licensed pharmacists, must seek the services of a professional chemist when analytical data upon his medicaments is desired. Should there not be some means of establishing that the person who renders such service has at least received an adequate basic training?

"At the present time, a person who consults or goes to a chemist to have work performed, has no assurance whatsoever that the person has any, much less adequate qualifications. If he consults a physician, a lawyer or an engineer who offers to practice, he can engage such professional services with some feeling of security because he knows that in order to practice as such, that professional man must have met at least a minimum of qualifications as established by the New York Board of Regents.

"Of all the professions, that of professional chemist is to our knowledge the only major one not now licensed in New York State.

"The sign John Smith, Professional Chemist, should have as much significance in its way as John Jones, Counselor at Law, or Richard Roe, Chemical Engineer. At present it does not.

"It is believed that the passage of this act, as drawn, will protect the people of the State of New York from danger to life and danger to health arising from the practice of professional chemistry by unqualified persons.

"The act will not affect nor regulate those engaged in industry, nor in agricultural studies, and properly exempts other licensed professions from its supervision, providing of course, that they do not offer their

services to the public as professional chemists.

"It is believed that the passage of this bill is desirable, if not in fact essential, in order to supplement those services which are already properly supervised in the State of New York by the Regents through other licensing acts. And in conclusion it should be stressed that the field of chemistry is not an isolated field, but one which borders on several already licensed by this State. There would appear to be a hole in the roof of protection erected over the public by licensing of professional practitioners and this act is designed to cover that hole, properly to protect the public."

President Moore then appointed a Committee, all of whom were residents of New York State, with Dr. Snell as Chairman, to further carry out the directions of the Council.

This Committee will no doubt also be ready to report.

JOSEPH W. E. HARRISSON, *Chairman*

Report of the Committee on Membership

About one hundred Fellows of the INSTITUTE have agreed to serve as members of this committee. Each member of the committee was furnished with a list of chemists in his territory who were evidently eligible for membership. A considerable proportion of the committee wrote personal letters to each prospect on his list, and some supplemented their invitations by interviews. Letters were sent by the chairman to all checked and recommended by the committee. About one hundred and fifty new members, mainly Fellows, have been added to the INSTITUTE as a result of the committee's work.

A large number of new names of properly qualified chemists are now being added to the committee's lists, many of these coming from Fellows in educational institutions.

W. T. READ, *Chairman.*

Report of the New York Chapter, 1938-1939

The New York Chapter suffered an irreparable loss through the death of its Chairman, Frederick J. Kenney, on February 23, 1939. At the meeting held by the Chapter on April twenty-eighth, a resolution on his passing was adopted and it was voted that it be spread on the minutes of the meeting and that a copy of it be sent to his family.

The Council of the Chapter held three meetings during the year, principally for the purpose of arranging for the Chapter meetings which took place on November ninth, January thirteenth, February seventeenth, and April twenty-eighth.

On the first of these dates a dinner was given in honor of Dr. Maximilian Toch, former President of the INSTITUTE. The feature of the second meeting was a symposium on "Can We Expand Public Research for Industry?", led by J. F. X. Harold, F.A.I.C., with discussion by F. G. Breyer, F.A.I.C., and by others. At the conclusion of this symposium, a committee was appointed, consisting of J. F. X. Harold, F. G. Breyer, and R. E. Kirk, F.A.I.C., to report to the National Council of the INSTITUTE the desirability of increasing employment of chemists by the government, under the direction of competent groups in the profession itself.

The third Chapter meeting was addressed by Ernest R. Bridgewater, F.A.I.C., who spoke on the "Advantages of Chemical Training in Technical Sales Work". At the fourth meeting, Joseph Ebert gave a talk on "The Chemist in Pharmaceutical Research".

All the meetings were well attended and there were lively discussions of each subject. The finances of the Chapter are in good condition.

F. W. ZERBAN, *Acting Chairman*

Report of the Niagara Chapter, 1938-1939

The activities of the Chapter during the past year have followed in a general way those of preceding years.

In addition to a summer picnic at Dr. Burwell's cottage at Wilson, N. Y., four formal meetings were held, two at Buffalo and two at Niagara Falls. One more meeting remains to be held. These meetings, which consist of a dinner and one or more prepared addresses, followed by general discussion, constitute a valuable activity of the Chapter, as they afford the members opportunity for personal contacts.

The Welfare Committee has maintained a register of unemployed chemists, and has secured positions for some. There appears to be very little unemployment among chemists in this area.

The Grosvenor Library Advisory Committee has prepared a list of books which the library is considering buying, and has circulated it to the membership for their recommendations.

The subject of licensing chemists has again come to the front. It was discussed at a recent meeting at which we were honored by an address from the National President. A special committee has been appointed to study the proposed licensing bill. Several members were invited to attend, and did attend, a meeting of the Executive Committee of the Western New York Section of the American Chemical Society, to discuss the subject with them.

WM. R. SHERIDAN, *Chairman*

Annual Report of the Washington Chapter, 1938-1939

The year opened with prospects that were not particularly encouraging. Treasury funds were exhausted, only a few members had paid their dues, a number of our most interested and dependable members were out of the City on official business and were not expected back for weeks or for months, and most of the remaining members appeared unenthusiastic or uninterested.

It therefore appeared urgent that something should be done immediately, if the Chapter was to continue to function and to be of service locally and nationally.

Accordingly, a letter was sent to every chemist whose name was on the Chapter's roster. The purpose of this letter was to stimulate interest in the Institute. The letter was really a "heart to heart" talk with each member and contained a plea for coöperation. It closed by asking that each member become "INSTITUTE Conscious" and asked specifically that each member (1) pay his dues; (2) attend meetings; (3) serve on Committees when asked; (4) secure at least one new member; (5) call attention to good speakers and assist in providing interesting meetings; and (6) calling attention to the fact that the officers are only the elected servants of the Chapter, chosen for the purpose of carrying out the wishes of the members and that the actions of

the members individually and collectively will either make or break the INSTITUTE.

The thought occurred that the INSTITUTE and the various Chapters are interested in all chemists and in turn all chemists, who are members, should have more voice in the administration of the affairs of the Chapter; in other words, it should not be a one-man organization. A large number of personal contacts were made and an Executive Committee was named. This consisted of the Officers of the Chapter and twenty members. The number serving on this Committee is somewhat large but since the Chapter has jurisdiction over three areas, the District of Columbia, Maryland, and Virginia and also since the four types of chemists: Civil Service, Industrial, Consulting, and Educational are represented in the Chapter's membership, it was thought necessary to have this number of members on the Committee in order that the membership should have adequate representation.

The first meeting of the Executive Committee was held at the Cosmos Club in Washington on the evening of December 6, 1938. After a discussion of ways and means of improving attendance at the evening meetings, a discussion took place concerning measures to be taken in order to improve in every way the general functioning of the Chapter.

As a result it was decided that the constitution and by-laws should be compared with those of the National Organization and amended wherever necessary in order to bring them up-to-date.

The consensus was that one reason for lack of interest was the lack of objectives, both locally and nationally, that would affect the membership of Washington Chapter to any great extent.

As a result of the Executive Committee meeting and other considerations, the following twelve committees were named: (1) Program; (2) Constitution and By-Laws; (3) Historical; (4) Membership and Attendance; (5) Legislation Pertaining to, and Affecting the Chemical Profession; (6) Issues and Objectives; (7) Student Medal Awards; (8) Publicity; (9) Unemployment, also Sub-Committee to work with Chemist Advisory Council; (10) Nominating; (11) Baltimore Dinner, and (12) Auditing.

All of these Committees have functioned to a certain extent. Some have not fulfilled the expectations of the membership, but nevertheless, a start has been made.

An increased interest in Chapter affairs was noticed after these preliminary measures were taken. This was indicated by the improved attendance at meetings and by gains in membership.

Three luncheons and two evening meetings have been held, as well as two Executive Committee meetings and one Executive Committee dinner. The luncheons and dinners were as follows: November 10, 1938, U. S. Department of Agriculture dining room. Dr. C. S. Piggot, Geophysical Laboratory, Washington, D. C., guest speaker. Subject, "Seabottom Profiles".

February 21, 1939, U. S. Department of Agriculture dining room. Dr. C. A. Browne, Department of Agriculture, guest speaker, subject, "Chemical Aspects of Colonial Museums in England and Holland".

March 22, 1939, Wardman Park Hotel, Executive Committee dinner. Guest of Honor, Mr. Robert J. Moore, National President, THE AMERICAN INSTITUTE OF CHEMISTS.

April 4, 1939, Hotel Rennert, Baltimore, Md., held as a group dinner during the American Chemical Society

Spring Meeting. The National and various Chapter Officers were the guest speakers.

The evening meetings were as follows: December 6, 1938, Executive Committee meeting, Cosmos Club.

January 27, 1939, Wardman Park Hotel, Dr. Henry G. Knight, F.A.I.C., Chief, Bureau of Chemistry and Soils, U. S. Department of Agriculture, guest speaker. Subject, "The Composition of the Chemist".

March 22, 1939, Wardman Park Hotel, Executive Committee meeting.

March 22, 1939, Wardman Park Hotel, Mr. Robert J. Moore, National President, THE AMERICAN INSTITUTE OF CHEMISTS, guest speaker. Subject, "Our Professional Organization".

One additional evening meeting is expected to be held on May 22, 1939. Election of Officers will take place. Two guest speakers have been invited to address the meeting. One will speak concerning seniority, present and proposed, as affecting technical employees of the government. The other will discuss highlights of the present Federal retirement law.

Since the auditing Committee has not yet reported, a financial statement cannot be given at this time. It may be stated, however, that the funds available at present will hardly cover the expenditures to date. It is expected in the future, due to increases in membership and due to the action of the Council, at the request of Washington Chapter, specifying that the National Organization will bear the cost of student medals, that more funds will be available and the condition of the treasury will improve.

The President of the Chapter, as a member of the National Membership Committee, has contacted over twenty prominent prospective members. He also addressed the Chemistry Section, American International Academy, Baltimore, Maryland, on the evening of March 23, 1939. The subject of the address was "The Chemist and His Profession". Incorporated in the address was a description of THE AMERICAN INSTITUTE OF CHEMISTS and its activities. It appears that several new INSTITUTE members are in prospect as a result of this contact. The Membership Committee of the Chapter has been active and has made a number of other contacts. Twenty-five chemists have joined the Chapter this year, several applications are pending, and a number of well qualified chemists are expected to join in the near future. The distribution of the new members geographically is as follows: District of Columbia 9; Maryland 3; Virginia 13.

Eight universities have been contacted relative to the student medal awards program. Five have already named their recipient and three remain to be heard from.

The Historical Committee has made a preliminary search of the records and correspondence with a view to writing a very complete history of Washington Chapter.

The Attendance Committee has succeeded in stimulating attendance by calling various members on the telephone on the day of the meeting and reminding them to attend.

The Publicity Committee has succeeded in having announcements of meetings printed in the local papers and notices posted on bulletin boards of various educational institutions, etc.

Through contacts with the national officers it is believed that the problems of the Chapter are better understood and will receive more consideration by the Council and that the problems of the National Organization are better

understood and will receive more sympathetic consideration from the Washington Chapter in the future.

The members of Washington Chapter feel that as a starting point THE AMERICAN INSTITUTE OF CHEMISTS could well offer to assist the Federal Government through service of its Council in an advisory capacity to the United States Civil Service Commission on matters relating to the qualifications and the classification of chemists. This action on the part of the National Organization will undoubtedly secure many new members in the area covered by Washington Chapter as well as stimulate the interest of a large percentage of the Chapter's members in the INSTITUTE.

In closing, I wish to express my appreciation and thanks to the national officers and to the officers, committees, and members of Washington Chapter, whose kindly coöperation has made it possible to classify the year 1938-39 as one of the most, if not the most, successful in the Chapter's history.

FRANK O. LUNDSTROM, *President*

Report of the Editor of The Chemist

THE CHEMIST continues to report in detail the activities of the National Council and the various Chapters in order to give members a knowledge of the work being done by the INSTITUTE and to encourage their participation in whatever projects they are personally interested.

Members have contributed generously by way of articles, clippings, book reviews, news items, obituaries, reports, and information, so that we have had sufficient material to fill each issue and to necessitate an increase in the number of pages from thirty-two to thirty-six, beginning with the December, 1938, issue. Among those members who contributed material regularly were Messrs. M. R. Bhagwat, Ed. F. Degering, George W. Fiero, Karl M. Herstein, Louis Marshall, Kenneth E. Shull, J. M. Taylor, G. P. Walton, and H. C. Winter. Several of our articles have inspired much correspondence, and steady inquiries for copies of THE CHEMIST or reprints have come in from individuals, college libraries, vocational guidance counselors, schools, and industrial libraries. An increasing number of subscriptions have been received from persons not members of the INSTITUTE which has enlarged our subscription list about eighteen per cent over that of last year. Quotations from THE CHEMIST have appeared in a number of professional publications. Also, we find an increased tendency for the public at large to use THE CHEMIST as an information bureau on everything pertaining to chemists or chemistry.

We have coöperated with the Chemist Advisory Council to assist it in making its excellent work known to chemists. Within THE CHEMIST, a department where unemployed members of the INSTITUTE, without charge, may state briefly their qualifications has been a means of bringing qualified chemists to the attention of employers.

We are deeply grateful to the National Council for its coöperation; to President Moore for his encouragement and editorials which vividly brought INSTITUTE activities to the attention of members; to all who contributed articles, clippings, advice, or other assistance; to the reporters of the meetings of the various Chapters; and particularly to Secretary Neiman for his generous coöperation and kind guidance.

VERA F. KIMBALL, *Editor*

COUNCIL

OFFICERS

President, Robert J. Moore
Vice-President, J. W. E. Harrisson
Secretary, Howard S. Neiman
Treasurer, Burke H. Knight

COUNCILORS

Ross A. Baker
Frank G. Breyer
M. L. Crossley
Gustav Egloff
Harry L. Fisher
Neil E. Gordon
W. T. Read
Norman A. Shepard
Maximilian Toch
Lloyd Van Doren
Gerald Wendt

CHAPTER REPRESENTATIVES

New York	*Niagara*	*Philadelphia*	*Washington*
W. D. Turner	A. W. Burwell	Gilbert E. Seil	Henry G. Knight

April Meeting

The one hundred and sixty-first meeting of the Council of The American Institute of Chemists was held at The Chemists' Club, 52 East 41st Street, New York, N. Y., on April 11, 1939, at six o'clock p.m.

Robert J. Moore, president, presided. The following officers and councilors were present: Messrs. R. A. Baker, H. L. Fisher, J. W. E. Harrisson, B. H. Knight, R. J. Moore, W. T. Read, G. E. Seil, M. Toch, W. D. Turner, and L. Van Doren. Mr. M. R. Bhagwat, Dr. Foster D. Snell, and Miss V. F. Kimball were present.

The minutes of the previous meeting were approved.

The Treasurer's report, showing a bank balance as of April 11, 1939, of $1,406.23, with all bills paid to date, was read and accepted.

Dr. Snell reported for the Committee on Arrangements for the Annual Meeting.

Dr. Harrisson reported the present progress of the Committee on Licenses, and upon motion made and seconded, it was decided to proceed with endeavors to obtain a New York State License Bill for chemists.

Upon motion made and seconded, the following Committee on the Proposed Amendment to the Education Law of the State of New York, to work with the Committee on Licensing, was appointed: Dr. Snell, Chairman; Dr. Kirk, and Dr. Toch.

The Steering Committee for the Committee on Licensing reported and was honorably discharged.

Upon motion made and seconded, the following resolution was adopted:

WHEREAS, the Council of The American Institute of Chemists has proposed legislation which would modify the Education Law of the State of

New York to require the licensure of a specific group of chemists, namely, those practicing before the public as professional chemists,

AND WHEREAS, in view of the pronouncement of the Council of The American Chemical Society at its April, 1939, meeting, upon the subject of limited licensure, and in view of its appointment of a committee to study the subject of licensure,

THEREFORE BE IT RESOLVED, that the Council of THE AMERICAN INSTITUTE OF CHEMISTS offers to the Committee of the Council and to the officers of The American Chemical Society its full coöperation.

The Secretary was requested to send copies of this resolution to the officers and the board of directors of The American Chemical Society, and to each of the local sections of The American Chemical Society in New York State. It was also requested that this be published in THE CHEMIST.

A preamble or short digest of the proposed License Bill for New York State was submitted by Dr. Harrisson, and after discussion, was referred to President Moore.

A report from Dr. Baker, Chairman of the Committee on Contacts for the Chemist Advisory Council, was read.

The following new members were elected:

FELLOWS

Bidlack, Verne C.
(1939), *Assistant to the President*, McCloskey Varnish Company, Philadelphia, Penna.

Fay, Marion
(1939), Woman's Medical College of Pennsylvania, East Falls, Philadelphia, Pennsylvania.

Hulett, George A.
(1939), *Professor*, Princeton University, Princeton, New Jersey.

Kupersmith, Irving A.
(1939), *Chemist*, Panama Railroad Company, Cristobal, Canal Zone.

Moxon, Alvin L.
(1939), *Acting Station Chemist*, South Dakota State College, Division of Agriculture, Brookings, South Dakota.

Rosser, Charles M.
(1939), *Research Chemist*, Sylvania Industrial Corporation, Fredericksburg, Virginia.

Kirkpatrick, Arnold
(1939), Technical Service Department, Monsanto Chemical Company, St. Louis, Missouri.

ASSOCIATE

Koprow, Longin
(A.1939), Analytical Chemist, Brooklyn Polytechnic Institute, 99 Livingston Street, Brooklyn, N. Y.

JUNIORS

Dondes, Seymour
(J.1939) 2922 West 35th Street, Brooklyn, New York.

Frederickson, Herbert E.
(J.1939), *Chemist*, E. J. Lavino and Company, Plymouth Meeting, Pa.

Greenbaum, George
(J.1939), *Graduate Student*, Massachusetts Institute of Technology, Cambridge, Massachusetts.

Oliver, Lorenzo, Jr.
(J.1939), *Chemist*, Puerto Rico Distilling Company, 370 Seventh Avenue, New York, New York.

Stewart, Wayne M.
(J.1939), *Graduate Student*, Colorado University, Boulder, Colorado.

STUDENTS

Gunther, Francis A.
(S.1939), *Senior Student,* University of Colorado, Boulder, Colorado.

McBride, Edward T.
(S.1939), *Laboratory Assistant,* Bakelite Corporation, Bloomfield, New Jersey.

Dr. Read reported for the Committee on Membership.

President Moore reported the activities of the Chapters which he had recently visited.

Dr. Harrisson reported that a meeting of Public Health Officials would be held in Washington, D. C., on April 25, 1939, and that they had made several statements which would tend to encroach upon the rights of professional chemists.

Upon motion made and seconded, Dr. Harrisson was appointed chairman of a Committee to inform this Public Health Group that THE AMERICAN INSTITUTE OF CHEMISTS is opposed to the broad definitions set forth in their announcements. Dr. Harrisson was also requested to appoint other members to assist him or to represent the INSTITUTE at these Public Health Meetings.

Mr. Bhagwat reported progress for the Chemist Advisory Council.

There being no further business, adjournment was taken.

May Meeting

The one hundred and sixty-second meeting of the Council of THE AMERICAN INSTITUTE OF CHEMISTS was held in the auditorium of the Science and Education Building, World's Fair, New York, at 12:00 o'clock noon on May 13, 1939.

President Robert J. Moore presided. The following officers and councilors were present: Messrs. R. A. Baker, F. G. Breyer, A. W. Burwell, M. L. Crossley, H. L. Fisher, J. W. E. Harrisson, B. H. Knight, R. J. Moore, H. S. Neiman, W. T. Read, G. E. Seil, M. Toch, W. D. Turner, and G. Wendt. Mr. M. R. Bhagwat was present.

The following member was elected:

FELLOW:

Sherwood, A. F.
(1939), *Chief Chemist,* Southern Railway Company, Alexandria, Virginia.

Mr. Frank O. Lundstrom, President of the Washington Chapter, presented a report from Dr. Hibben in connection with the proposed survey of chemists by the Department of Labor. Mr. Lubin of the Department stated that due to other summaries and reports their entire legal staff will be busy for the next few months and that possibly they can consider the chemist survey after July first. Mr. Lubin advised us to contact Senator Wagner of New York in order to speed the matter up. Dr. Toch was appointed chairman of a committee to approach Senator Wagner with regard to this act. It was pointed out that Professor Whitmore has also been elected by an American Chemical Society Committee to work on such a survey with the Labor Department.

Upon motion made and seconded, a vote of thanks was extended to the Washington Chapter for its excellent arrangements in connection with the Baltimore meeting of that Chapter.

Upon motion made and seconded, a vote of thanks was extended to Dr. Gerald Wendt for his efforts in behalf of the Annual Meeting of the INSTITUTE at the World's Fair and for the excellent provisions which he made for us.

Upon motion made and seconded, it was decided to hold the letter of Mr. Lundstrom regarding Civil Service to

be considered at an adjourned meeting of the Council.

Upon motion made and seconded, it was decided that applications for membership should be referred to the adjourned meeting of the Council.

Upon motion made and seconded, the meeting was adjourned until Tuesday, May 23, 1939, at 6:30 o'clock at The Chemists' Club, New York, N. Y.

The one hundred and sixty-third meeting of the Council of THE AMERICAN INSTITUTE OF CHEMISTS was held in The Chemists' Club, 52 East 41st Street, New York, N. Y., at 6:30 P. M. on May 23, 1939.

President Robert J. Moore presided. The following officers and councilors were present: Messrs. D. H. Andrews, R. A. Baker, M. L. Crossley, R. J. Moore, W. T. Read, N. A. Shepard, M. Toch and W. D. Turner. Mr. M. R. Bhagwat and Miss V. F. Kimball were present.

In the absence of the Secretary, Miss Kimball was requested to act as Secretary *pro-tem.*

The President announced that this meeting was the continuation of the adjourned Council meeting held on May thirteenth at the World's Fair.

The minutes of the meeting on May thirteenth were read and approved.

Upon motion made and seconded, it was decided to invite the chairmen of the various committees to attend the council meetings.

Dr. Read, Chairman of the Committee on Membership, reported the plans of that committee for its activities during the summer. Upon motion made and seconded, $300.00 was appropriated for the work of the Membership Committee during the coming year.

A letter from Mr. Lundstrom, Chairman of the Washington Chapter, was read. It recommended that the INSTITUTE act in an advisory capacity to the U. S. Civil Service Commission. Upon motion made and seconded, the proposal of the Washington Chapter was endorsed and the Council offered its assistance to the U. S. Civil Service Commission. The Washington Chapter was also requested to make specific suggestions regarding the methods of rendering assistance.

Dr. W. D. Turner was appointed chairman of the Committee on Ethics, with other members to be appointed later.

After discussion, and upon motion made and seconded, it was decided to change the wording of the proposed license bill for New York State by substituting "to practice as licensed chemist" for "to practice as licensed professional chemist".

Plans were made for Fall publicity concerning the licensing bill.

Upon motion made and seconded, Dr. Harrisson was requested to have five hundred copies of the proposed bill for licensing chemists in New York State mimeographed.

The application of Percy A. Wells to be raised from Junior to Fellow was granted.

The following new members were elected:

FELLOWS:

Briese, Reinhold Rudolph
(1939), *Junior Chemist*, Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

Carroll, Richard Henry
(1939), *Chief Chemist*, Climax Rubber Company, 274 Ten Eyck Street, Brooklyn, N. Y.

ASSOCIATE:

Swern, Daniel
(A.1939), *Junior Chemist*, Industrial Farm Products Research Division, U. S. Department of Agriculture, Washington, D. C.

JUNIOR:

Butcosk, Arthur Frank
(J.1939), *Junior Chemist*, Southern Railway System, Test Department, Henry and Wilke Street, Alexandria, Virginia.

Upon motion made and seconded, the matter of the place of the next annual meeting was referred to the Council meeting to be held next December.

Mr. M. R. Bhagwat reported for the Chemist Advisory Council, and upon motion made and seconded, $50.00 were contributed to the Advisory Council.

There being no further business, adjournment was taken.

CHAPTERS

New York

Chairman, Harry G. Lindwald *Vice-Chairman*, Beverly L. Clarke

Secretary-treasurer, D. H. Jackson
17 John Street
New York, N. Y.

Council Representative, Charles A. Marlies

The fourth and last regular meeting of the season of the New York Chapter was held at The Chemists' Club, New York, on April twenty-eighth. Dr. Joseph Ebert, president of the Farastan Company, Philadelphia, spoke on the subject of "The Chemist in the Pharmaceutical Industry".

Dr. Ebert's very interesting talk about the contributions and requirements for chemists in the pharmaceutical industry will appear in full in the September issue of THE CHEMIST.

The annual business meeting for election of officers for the New York Chapter was held at The Chemists' Club on May nineteenth. The following new officers were elected: Chairman, Harry G. Lindwall; Vice-chairman, Beverly L. Clarke; Secretary-Treasurer, D. H. Jackson; Councilors, W. D. Turner and Victor H. Turkington; Representative to the National Council, Charles A. Marlies.

Following the election of officers, the members were shown an excellent industrial film through the courtesy of The Johns Manville Corporation.

Niagara

Chairman, William R. Sheridan *Vice-chairman,* Maurice C. Taylor

Secretary-treasurer, Carl H. Rasch
1212 Oliver Street
North Tonawanda, N. Y.

News Reporter to THE CHEMIST, George W. Fiero

Council Representative, Arthur W. Burwell

The March meeting of the Niagara Chapter was held on March thirty-first at the Red Coach Inn, Niagara Falls. The speaker of the evening was Mr. Robert J. Moore, president of THE AMERICAN INSTITUTE OF CHEMISTS, who spoke on "The Question of Licensing of Chemists". Mr. Moore gave a brief history of the INSTITUTE, stressing its relationship with the American Chemical Society whose work it does not duplicate. The aims of the INSTITUTE were discussed, together with a description of Chemist Advisory Council and the work it has done for unemployed chemists.

Regarding licensing, Mr. Moore stated that chemists were the only profession without state laws and licensing and, because the laity does not recognize the chemist as a professional man, he is subject to demands of labor for unionizing, etc. He pointed out that anyone can call himself a chemist and practice the profession, and also that licensing would make it easier for a chemist to qualify for court proceedings.

Because the State of New York has already passed a law requiring that state-employed chemists and engineers hold a license before advancement beyond a certain grade, state and municipal chemists threatened to draft a licensing law. It would seem advisable to have the law drafted by such a professional organization as the INSTITUTE. The proposed bill, which has just been modified, resembles, to a large extent, the professional engineering laws, dealing only with state and municipal chemists and professional chemists, but not including those chemists with private companies.

There followed a very lengthy discussion. Dr. Benner pointed out that the requirements of the proposed law were not strict enough and compared them with medical license laws. This was answered to the effect that it was better to pass the bill as drafted and increase the requirements when necessary from time to time as has been done in other professions. Mr. Naylor, secretary of the local chapter of the Professional Engineers' Association, pointed out that the New York engineering law was, like the chemist bill, a pilot law and that it has been followed by thirty-four other states. He made two suggestions based upon experience with the engineering law: 1. The examining board was left to political appointees, but fortunately, the board has been satisfactory. 2. The fees were not "earmarked" for inspection with the result that one inspector attempts to cover the entire state, and the balance of fees is used for general state purposes.

Dr. A. G. Scroggie, chairman of the Western New York Section of the American Chemical Society, stated that the executive committee of the Section had discussed the bill, had opposed it as drafted, and had authorized the secretary to so advise senators and assemblymen. Commenting on Mr. Moore's

address, he stated that Dr. Parsons was not in favor of licensing; he questioned the value of a license in court proceedings; since plant chemists were not required to be licensed, the law would not affect the attempts at unionization; several parts of the bill were questioned; he wondered if the chemists throughout the state were in favor of the bill. Mr. Moore stated that the New York Section of the American Chemical Society favored the bill.

Upon motion, a committee was appointed to gather comments, both *pro* and *con*, and submit the information to the Licensing Committee. In view of the revised suggested bill, the local Section of the American Chemical Society was asked to reconsider its previous action.

Pennsylvania

Chairman, Walter L. Obold *Vice-Chairman*, A. C. Angus

Secretary-treasurer, Harry C. Winter
The Biochemical Research Foundation
133 South 36th Street
Philadelphia, Penna.

Council Representative, Gilbert E. Seil

News Reporter to THE CHEMIST, Kenneth A. Shull

A meeting of the Pennsylvania Chapter was held at the Christian Association Building on Tuesday evening, April twenty-fifth, Dr. George R. Bancroft presiding. Fifty-two members and guests attended.

At the business meeting following an informal dinner, Dr. Howard Stoertz gave a report of the activities of the Technical Advisory Committee of the Philadelphia Chamber of Commerce. Reporting for the Nominating Committee, Dr. A. C. Angus submitted the following names as candidates for the 1939-1940 term: Dr. W. L. Obold, chairman; Dr. A. C. Angus, Vice-chairman; H. C. Winter, Secretary-Treasurer; Dr. G. E. Seil, Council Representative; and K. E. Shull, Reporter. These officers were unanimously elected by the Chapter. The Secretary announced that an inspection trip would be made through the Pennsylvania Sugar Refinery on the evening of Tuesday, May ninth. An outing was also tentatively scheduled for some time in June.

The main speaker of the evening was Dr. Joseph W. E. Harrisson well known to all A.I.C. members. In addition to being vice-president of the INSTITUTE, Dr. Harrisson is president of the newly formed Pennsylvania Chemical Society, and is active in many other scientific organizations.

Speaking on "Food and Drug Control Under the New Act", Dr. Harrisson pointed out that the new Act is much wider in scope than the one which has been in existence for the past thirty years. For one thing it includes clauses pertaining to the control of devices and cosmetics; also the legal right to promulgate definitions of identity for food products. It gives the government control over products which have passed the imaginary state borders and gives the right to make factory inspections. Hereafter it will be necessary for all drugs to contain complete directions for use as well as statements as to conditions under which they are not suitable for use. Thus a drug is said to be misbranded if the label states that it is

good for headaches but makes no mention of an effect on the heart when it actually does prove detrimental to the heart.

The Act operates against: (1) Food, which includes all articles used for food or drink for man or other animals, chewing gum, and articles entering into the manufacture of these. (2) Drugs, comprising all entities in the *U. S. Pharmacopoeia, National Formulary,* and *Homeopathic Pharmacopoeia,* articles intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in man or other animal. (3) Devices, which include instruments, apparatus, etc. intended for use in diagnosis and cure in man or animals. (4) Cosmetics, which consist of articles intended to be rubbed, poured, sprinkled, sprayed on, introduced into, or otherwise applied to the human body or any part for cleansing, beautifying, promoting attractiveness or altering appearance.

Dr. Harrisson interspersed, throughout his lecture, many humorous cases where manufacturers have tried, by hook or crook, to fool the gullible public.

An interesting and lively discussion followed the talk.

On March twenty-first, the Pennsylvania Chapter of THE AMERICAN INSTITUTE OF CHEMISTS was favored with a visit by Mr. Robert J. Moore, president of the national organization, and Dr. W. T. Read, member of the Board of Directors of the Chemist Advisory Council. Forty members and guests were present to welcome them to the Chapter.

Chairman Bancroft presided over the short business meeting which followed an informal dinner. Dr. Joseph W. E. Harrisson, Committee on Student Awards, read a list of fourteen colleges and universities through which he proposed that the Pennsylvania Chapter award student medals. This proposal was adopted by unanimous vote. The Chairman appointed the following members to serve as a nominating committee for the nomination of Chapter officers for the 1939-40 season: Drs. Arthur Osol, Joel Harris, C. W. Rivise, Avenir Proskouriakoff, Addison Angus (chairman).

At the conclusion of the business meeting, Dr. Bancroft introduced Mr. Moore to the group. Mr. Moore opened his address with a brief review of THE AMERICAN INSTITUTE OF CHEMISTS which arose out of the question of the classification of the large membership of the American Chemical Society. He discussed the relationship of the two organizations, pointing out that while the purpose of the American Chemical Society is the "encouragement and advancement of chemistry in all its branches", the purpose of the INSTITUTE is the promotion of the professional interests of the chemist, particularly as regards business and technical ethics, adequate training, contracts, and legislation. The activities of the one group complements the activities of the other.

Mr. Moore stated that the INSTITUTE must be alert to any movement which adversely affects the chemist and warned against the incorporation of chemists in labor unions. He praised the work which the Chemist Advisory Council is doing for the unemployed members of the profession. As regards licensing of chemists, Mr. Moore asserted that if state legislatures are going to pass license laws whether or not the profession advocates them, it is far better that such legislation be under the guidance of some interested professional group than to permit legislators to frame a loose classification. The chemical profession is the only professional group without state licensing or state definition.

Dr. W. T. Read, F.A.I.C., chose for his subject "Some Problems of the Chemical Profession". After outlining briefly the characteristics of the chemical profession and comparing it with the legal, medical, and engineering professions, Dr. Read discussed as major problems facing the chemical profession, licensing, training, professional development, economic status, unemployment, and coöperation for mutual welfare. He spoke somewhat in detail regarding unemployment problems that are being handled by the Chemist Advisory Council. He denied that the unemployed chemists registered with the Council are chiefly the castaways and incapable members of the profession. He cited specific examples to illustrate the wonderful possibilities for salvage in this group. He completed his address by analyzing a number of cases illustrating the variety of difficulties of unemployed chemists and also presented the point of view of chemical executives who are forced to cut down their staffs.

It is hardly necessary to add that this program evoked one of the most lively discussions of the season.

Washington

President, Frank O. Lundstrom

Vice-president, Albin W. Warth *Treasurer,* Joseph J. Stubbs

Secretary, A. P. Bradshaw

2121 New York Avenue, Washington, D. C.

News Reporter to THE CHEMIST, G. P. Walton

Council Representative, Henry G. Knight

Executive Committee

M. S. Anderson	J. H. Hibben	R. M. Mehurin	E. F. Synder
P. R. Dawson	L. N. Markwood	A. R. Merz	E. K. Ventre
R. B. Deemer	N. W. Matthews	H. P. Newton	C. W. Whittaker
H. C. Fuller	J. W. McBurney	W. M. Noble	J. F. Williams
L. R. Heiss	A. L. Mehring	W. H. Ross	P. A. Wright

The regular March meeting of Washington Chapter was held at Wardman Park Hotel, March 22, 1939. President Frank O. Lundstrom presided; forty-odd members and guests were present. Our national president, Robert J. Moore, was the guest speaker on this occasion.

Preceding the meeting, the Executive Committee held a dinner in honor of Mr. Moore, at the same hotel, which was well attended by an enthusiastic and earnest group of workers in the local Chapter. This dinner meeting of the Executive Committee developed into a heart-to-heart talk with the national president regarding the objectives of the INSTITUTE, and means for better cooperation among Council and Chapters in furthering these objectives.

Mr. Moore suggested:

1. When Council members anticipate business in Washington, it would be well to try to make the visit coincide with a Chapter meeting;

2. Congruently, Chapter members, when going to New York, might endeavor to have their visits coincide with the Council meeting.

At the regular meeting, announcement was made of the death, on February twenty-second, of Dr. Charles R. Ely, F.A.I.C. (1936); the members rising in silent tribute to his memory.

Reports were received from nine active committees, showing commendable support of President Lundstrom's comprehensive program.

The Medal Awards Committee, through President Lundstrom, reported that the National Council has approved the Chapter's recommendations that Student Medal Awards and A.I.C. junior memberships be offered in the following eight universities: American; Catholic; Georgetown; George Washington; Howard; Johns Hopkins; Maryland, and Virginia. Preliminary letters to these institutions have been dispatched; and replies have been received from four of them. The medals and engravings are to be provided by the National treasury, and the clerical and typing costs by the local committee.

The Unemployment Committee, through J. F. Williams, announced certain gifts which had been received by the Chemist Advisory Council; and advocated that each member contribute at least $1.00 per year, for this work.

Mr. Robert J. Moore, National President, whose position is that of development manager of the Varnish-resin Division of the Bakelite Corporation, was introduced by Mr. Lundstrom. Mr. Moore addressed the Chapter on "Our Professional Organization". He spoke briefly on the history of the development of the INSTITUTE, and stressed the point that the purpose of this new society was specifically to promote interest in the welfare of the chemist. This was to be accomplished through requiring adequate training and experience as a pre-requisite to acquiring the designation, "Professional Chemist"; by fighting legislation, which affects the chemist adversely; by securing helpful legislation and licensing laws; by raising the professional morale of the chemist, through such work as that of the Chemist Advisory Council (which sprang from the A.I.C.); and by being alert to the dangers threatening the integrity of chemists, such as unfavorable unionization. Mr. Moore called attention to the following considerations: The chemist is not to be classed as "laborer"; chemistry is not a "trade"; but what proof have we? medicine, law, engineering, architecture are all definitely defined professions, and are State licensed; but not the chemist! He then discussed proposed licensing laws, mentioning that a committee of the Council of the A.I.C. has drafted a bill for the State of New York, which there is reason to hope will be passed. On the whole most INSTITUTE members, he believes, have felt that the arguments in favor of licensing outweigh those against it. Mention was made of a request made upon the Department of Labor to undertake a survey of chemists, such as it made some years ago for engineers; and hopes are held that it will soon be under way.

In closing, Mr. Moore paid high tribute to the work on the Membership Committee of Dr. W. T. Read; and advocated that every member wear the Key-charm of the INSTITUTE. The custom would spread and favorably advertise the society. The program of the Annual Meeting, May 13th, at the New York World's Fair was touched upon. Dr. Gerald Wendt, F.A.I.C., director of science and education at the Fair, has had an active part in planning this program. As a final word for the members, Mr. Moore emphasized the proposition that the two American Societies of chemists, the American Chemical Society and THE AMERICAN INSTITUTE OF CHEMISTS are complementary to, and

augment each other. Animated discussion followed, particularly regarding the proposed licensing laws. Mr. Moore suggested that an article be prepared for THE CHEMIST, on "What Licensing Would Mean to the Government Chemist".

BOOKS

THE CHEMISTRY AND TECHNOLOGY OF RUBBER, Edited by Carroll C. Davis, John T. Blake, Associate Editor, 808 pages and Index, *Reinhold Publishing Corporation*, New York. $15.00.

This American Chemical Society monograph is a monumental work, numbering among its contributors the leading rubber chemists of this country, Canada, and Europe. In addition to outstanding articles on the various features of rubber chemistry and technology, it includes what is probably the most comprehensive bibliography on its subjects which has ever been attempted. No attempt will be made in this brief review to indicate in other than the most general way the breadth of scope of this volume.

In the Preface, the Editor-in-Chief describes the work as a textbook, but we consider that either "compendium" or "encyclopedia" would be a more fitting term. The chapters range from the "Composition of Crude Rubber", through "Physical Properties of Raw Rubber", "Chemistry and Structure of Rubber Hydrocarbons", "Theories and Phenomena of Vulcanization", "Accelerators", "The Physics of Vulcanized Rubber", "Pro-oxygens and Antioxygens", "The Electrical Behavior of Rubber", "Industrial Uses of Latex", "Gutta Percha and Balata" to "Chemical Analysis of Rubber and Rubber Products" and "Literature on the Chemistry of Rubber", in which formidable list we have named less than half of the twenty-six chapters.

The presentation is complete, if tending slightly toward the natural didacticism of specialists. References to sources as well as the literature survey at the end of the book are most comprehensive.

No chemist working in rubber can afford to omit this volume from his reference shelf.

INDUSTRIAL CHEMISTRY, by William Thornton Read, F.A.I.C., Second Edition, 577 pp. and Index, *John Wiley & Sons, Inc.*, New York. $5.00.

This second edition of Dr. Read's textbook on industrial chemistry should prove to be a delight to the student as well as to the teacher. The introductory chapters offer a distinctive, refreshing approach to the subject of chemical engineering in the form of an analysis of the general purposes of the science, coupled with a summary of the requirements for success in its study and its practice.

Next in order follow terse discussions of the unit operations, of materials of construction and of the basic principles of chemical engineering calculations.

The body of the work, as may be expected, is devoted to a series of brief but clear and informative studies of the varied chemical industries, with profuse illustration, divided about equally between photographs of actual plant installations and flowsheets of important processes.

In each description of an industry,

primary stress is laid upon the basic chemical reactions which make the industry possible, an outline of these being followed, in each case, by an interesting survey of the practical process and mechanical developments which, in each case, have established an industry upon the base of its underlying reactions.

That this reviewer has found the sections on Power Plant Chemistry, Petroleum Industry, Electrochemical Industries and Rubber of most interest implies no depreciation of the balance of the work, all of which presents sound matter in a most engaging style.

SOLVENTS by Thomas H. Durrans. *D. Van Nostrand Company, Inc.* $5.00.

The best measure of the usefulness of the current volume is the fact that it represents the fourth revised edition since 1930.

The present edition is divided into two parts, of which the first, comprising about one quarter of the book, is concerned with the general aspects of solvents and a theoretical discussion of the principles involved in their functioning. In addition, there is a chapter on toxicity.

The second part of the book discusses individual solvents under a rough chemical classification. Concerning each individual solvent, it lists the ordinary physical constants and its solvent power for various materials.

There are two appendices: The first listing solvents by trade names and probable compositions; the second comprising a detailed solubility table. The book is well bound and well indexed, and should be exceedingly useful as a compendium of solvent data as well as furnishing a handbook for workers in the lacquer field, for example.

—KARL M. HERSTEIN, F.A.I.C.

UNIT PROCESSES IN ORGANIC SYNTHESIS. By P. H. Groggins. Published by the *McGraw-Hill Book Company*. Second edition. 1938. $6.00.

This book, one of the *Chemical Engineering Series*, is designed to bring to the organic chemist who has been forced to focus his interest on some restricted field the accumulated knowledge of the field of organic synthesis. The more important and well-defined reactions of organic synthesis are presented in a systematic manner, combined with pertinent information derived from inorganic and physical chemistry as well as the contributions of the chemical engineer. Attention is directed not only to the chemistry and products of reaction, but to the contributing factors and agencies which lead to efficient operation as well.

Each well-defined reaction of organic synthesis is treated in a separate chapter. Chapter 1 deals with Nitration; Chapter 2 with Amination by Reduction, Chapter 3, Diazotization and Coupling; Chapter 4, Halogenation; Chapter 5, Sulfonation; Chapter 6, Amination by Ammonolysis; Chapter 7, Oxidation; Chapter 8, Hydrogenation; Chapter 9, Alkylation; Chapter 10, Esterification; Chapter 11, Hydrolysis; Chapter 12, The Friedel and Crafts Reaction; and Chapter 13, Polymerization.

In this second and enlarged edition every chapter has been revised and brought into line with current developments. Some chapters retain their former outline, while others have undergone marked transformation. A substantial number of new flow sheets have been added and increased emphasis has been placed on aliphatic compounds and halogenation and hydrogenation reactions.

—RAY E. INGLEHART.

SOILLESS GROWTH OF PLANTS. By Carlton Ellis, F.A.I.C., and Miller W. Swaney. *Reinhold Publishing Corporation.* 155 pages. $2.75.

This treatise covering the fascinating art of growing plants without soil deserves its wide popularity. Either the professional horticulturist or the amateur who is interested in this subject will find much information of value. The chemistry of plant life is clearly explained. Various methods of soilless culture are described, so that the amateur may apply those suitable for houseplants or the professional may use those recommended for commercial vegetable growing. The effects of various chemicals on plants, plant hormones, and the causes of growth failures are also discussed. In addition, there are complete formulas for nutrient solutions, given both in gram measurements and in approximate measurements for the non-scientific experimenter.

The easy, readable style of writing, the attractive photographic illustrations, and the information about the subject, clearly explained for the non-technical reader, all contribute to the worthwhile character of this book.

V. F. KIMBALL

MODERN METHODS OF REFINING LUBRICATING OILS, by Vladimir A. Kalichevsky, 199 pages, Appendix and Index, *Reinhold Publishing Company*, New York. $6.00.

This compact treatise on the production, dewaxing, deasphalting and general refining of lubricating oils, an American Chemical Society monograph, is devoted chiefly to exposition of the solvent treating procedures which have recently gained so much prominence in the refining of lubricants.

Beginning with a chapter on the "Properties of Refined Oils", the monograph progresses through discussion of the relationship of solvent methods to acid refining methods, a description of the types and properties of petroleum waxes, filter and dewaxing, solvent dewaxing, deoiling of waxes, conventional and solvent deasphalting, followed by six chapters on the various features of solvent refining.

The five final chapters are devoted to consideration of various additions to lubricating oils of non-petroleum substances for modification of particular properties of the lubricants, such as pour point or viscosity index. The appendix contains useful tables and the usual author and subject indexes are supplemented by a profuse Patent Index, the value of which might have been improved by addition of titles and patentees' names to the patent numbers given.

The author's style is terse, but highly readable and the monograph represents a distinct addition to the chemical and process literature on lubricants.

THE SOLUTIONS OF PROBLEMS IN QUANTITATIVE ANALYSIS. By Saul B. Arenson, F.A.I.C. *Edwards Brothers, Inc.*, Ann Arbor, Michigan. 1938.

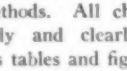
The author, who is professor of inorganic chemistry at the University of Cincinnati, here presents forty-one pages of problems and answers for the student of quantitative analysis. He covers the field exceptionally well and gives sample problems and methods of solution for each type of problem. The student will find this photo-offset publication excellent to familiarize him with the different problems of quantitative analysis.

—Ray E. Inglehart.

HANDBUCH DER GALENISCHEN PHARMAZIE. By Dr. Fritz Gstirner. *Apothecker-Verlag*, Berlin, Germany. 710 pages.

This book gives manufacturing methods and essays of preparations of the galenic pharmacy. Many of these methods are not known in this country and the author also offers improvements on known methods. All chapters are comprehensively and clearly written, with numerous tables and figures. It is a book of real value.

—RUDOLF SEIDEN.



Certain numbers of back issues of THE CHEMIST are available at fifteen cents each, and for the convenience of our readers, titles of some of the articles, grouped under subject heads, are listed below, followed by the date of THE CHEMIST in which they appear:

Agriculture

Research Aid to Agriculture, Theodore Swann. November, 1931.

The Chemist and Stockpoisoning Plants, J. F. Couch. December, 1931.

The Chemist's Influence in Agricultural Economics, B. G. Klugh. March, 1932.

Biography

The Mellon Institute and Andrew and Richard Mellon (entire issue). April, 1931.

Charles H. Herty—Apostle to the South, Florence E. Wall. February, 1932.

Gregory Paul Baxter—Quantitative Analyst, H. W. Starkweather. March, 1932.

Charles H. Herty, Marston T. Bogart, Henry W. Jessup, et al. June, 1932.

Marston Taylor Bogert, Medalist, Florence E. Wall. April, 1936.

The Wizard of Tuskegee—George W. Carver, W. W. Moss. October, 1936.

Chemical Warfare

Gas—The Latest Concept of Warfare, L. C. Elmore. January, 1936.

The Chemist in Warfare, L. C. Elmore. April, 1936.

Chemistry and Military Explosives, C. G. Storm. April, 1932.

Economics

The New Chemistry of the New Russia, Lily B. Daetrick. April, 1932.

Economic Importance of Research Advances, F. P. Dengler. July, 1932.

The Chemist—Creator of Wealth, F. H. Bivins. January, 1932.

New Paths in Chemistry, C. D. Ingersoll. February, 1932.

The Influence of Business Risks on the Chemical Industry, D. P. Morgan. March, 1932.

The Berezniki Chemical Combine, L. G. Khvostovsky. February, 1932.

Education

Chemistry at Princeton, William Foster. November, 1931.

Chemistry at Western Reserve, O. F. Tower. March, 1932.

Training the Chemical Engineer at Princeton, J. C. Elgin. April, 1932.

Chemistry at Nebraska, Fred W. Upson. June, 1932.

Chemistry at Vassar, Mary L. Sague. October, 1932.

Chemistry at Wisconsin, H. A. Schuette. April, 1933.

Chemistry at Massachusetts Institute of Technology, Tenney L. Davis. September, 1933.

Chemistry at the University of Alabama, J. P. Montgomery. September, 1934.

Chemistry at Colorado College, Frank W. Douglas. October, 1934.

Industry

The Chemist in the Cosmetic Industry, R. F. Revson. December, 1931.

Chemistry and the Telephone, R. R. Williams. December, 1931.

Eastman Chemical Research, Walter Clark. January, 1932.

The Chemist in the Department Store, Ephraim Freedman. May, 1932.

Chemistry and the United Fruit Company, Hartley Rowe. June, 1932.

The Place of Chemistry in the Carpet Industry, G. E. Hopkins. July, 1932.

Science in Merchandising, Ellery H. Harvey. February, 1933.

The Contribution of Chemists to Various Industries (entire issue). April, 1935.

Government Bureaus and Services

Censoring Foods and Drugs, P. B. Dunbar. October, 1932.

The Bureau of Home Economics, Ruth O'Brien. November, 1932.

The Bureau of Mines, A. C. Fieldner. May, 1932.

Chemists of the Patent Office, Joseph Rossman. June, 1932.

Medical

The Chemist in Medico-Legal Work, Alexander O. Gettler. March, 1931.

A Medical Chemist Looks at Professional Ethics, Max Trumper. March, 1931.

Economic Prospects of the Medical Chemist, John M. Ort. April, 1932.

Premedical Courses in Chemistry, J. P. Montgomery. May, 1932.

The Chemist in Public Health, S. M. Weisberg. November, 1931.

Vocational

The Consulting Chemist, Thomas A. Wright. November, 1931.

When You Decide to Go in for Research, Harden F. Taylor. December, 1931.

The Status of Women Chemists, Florence E. Wall. April, 1938.

Miscellaneous

Chemists in Philately, J. N. Taylor. October, 1936.

Vivid Technical Reports, Edward Thomas. January, 1932.

The University of Alabama Chapter of the Society of the Sigma Xi was installed on April fourth. Dr. Edward Ellery, national secretary of Sigma Xi, gave an address on "The Urge to Know and Academic Freedom", at a special morning convocation. Dr. George A. Baitsell, National President of Sigma Xi, gave a lecture on "Uniformity in Nature" immediately after the banquet. During the formal installation exercises, the following were elected officers of the new chapter: President, Dr. Emmett B. Carmichael, F.A.I.C., professor of physiological chemistry; Vice-president, Dr. J. D. Mancill, assistant professor of mathematics; Secretary, Dr. E. F. Richards, assistant professor of geology; and Treasurer, Mr. B. W. Gandrud, metallurgist, U. S. Bureau of Mines, Southern Experiment Station, Tuscaloosa, Alabama.

Frank O. Lundstrom, president of the Washington Chapter, A.I.C., addressed the Chemical Section of the American International Academy, on March twenty-third, at Baltimore, Maryland. His subject was "The Chemist and His Profession."

Wanted

ELECTRODE for pH determinations, potentiometer, and a good research microscope. Please write, quoting price, to M. M. Luchins, A.A.I.C., 24 Stone Street, New York, N. Y.

NORTHERN LIGHTS

***By* Howard W. Post, F.A.I.C.**

According to *Nature*, **143** 647 (1939), 1,338 million imperial gallons of petroleum products were "delivered" in Canada during the calendar year 1937. This figure is broken up into 589 million gallons of fuel oil, 30 million of kerosene and 719 million of gasoline. In addition, 48 million short tons of petroleum were used in refineries. More than 91 per cent of the fuel oil mentioned above was processed in Canadian refineries. Incidentally, the figure of 719 million gallons of gasoline represents an increase of 194 million over the consumption for 1936.

We point with pride to the inclusion of the name of our national president, Robert J. Moore, on the program of the coming Canadian Chemical Convention at London, Ontario, June fifth to eighth. He will speak at the noon luncheon Tuesday, June sixth.

The general secretary of the *Canadian Institute of Chemistry* will present a paper at this meeting on the subject of professional futures, "Chemical Unemployment. Are too many chemists being trained in Canada?" That should be interesting. It is a subject on which most all of us have some ideas of our own.

Most of the news items in the latest number of *Canadian Chemistry and Process Industries* deal with the forthcoming Canadian Chemical Convention and the visit of the King and Queen to London (Ontario) on the morning of Wednesday, June seventh.

One item in particular we take the liberty of presenting verbatim. It will be found in *Canadian Chemistry and Process Industries* **23** 172 (1939). We quote as follows:

"The Canadian Council, Society of Chemical Industry, at its last meeting, decided to institute the award of a medal for outstanding achievement in chemistry or in industrial chemistry in Canada. No other chemical organization in the Dominion has yet established a medal award, although some of the sections do present prizes to students and junior members.

The Engineering Institute of Canada, the Canadian Institute of Mining and Metallurgy and the Royal Society of Canada, present medals annually for distinguished work in engineering, mining and pure science.

The new medal will be called The Society of Chemical Industry (Canada) Medal and may be awarded to anyone associated with Canadian chemical industry for services to the industry or for outstanding industrial scientific chemical achievement. It is to be presented not oftener than every two years.

The Medallist for 1939 is now being nominated, and the first presentation is to be made at the Canadian Chemical Convention on Wednesday, June seventh, at a suitable ceremony."

Alexander Silverman, F.A.I.C., head of the Department of Chemistry in the University of Pittsburgh, has been reappointed to the Division of Chemistry and Chemical Technology of the National Research Council for another period of two years.

THE SCIENCE ANGLER

Kenneth E. Shull, J.A.I.C.

A few months ago a novel method for peeling potatoes was reported in the literature. This consists of exposing the tubers to a temperature of 1750 degrees F. for a few seconds; then subjecting them to a high pressure water spray. The treatment completely removes the skin, leaving only the eyes and blemishes to be plucked by hand.

Not wishing to be outdone, Botanists have now developed a new variety of potato, the surface of which is uniformly smooth. With this in hand routine spud paring should prove to be a much more pleasant enterprise.

It is difficult to imagine the use of dust to prevent dust explosions in mines; yet paper bags containing powdered limestone are actually being employed for this purpose.

These bags, stationed on platforms at strategic points throughout the mine, are caused to fall to the ground by the shock wave of an explosion occurring in some other part of the mine. The contents are scattered through the subterranean channels, and function in two ways in preventing dust explosions: (1) Absorb heat from the finely divided particles of coal, and (2) dilute the coal dust with an inert material. Thus if any detonation does take place it will be less severe.

One doesn't have to be a swell-headed person to appreciate a newly developed "hat size". This product, known commercially as "Size-In", is said to completely renovate ones' cranial covering. Felt hats are given back their original body and stiffness along with the soft finish characteristic of the new article.

Pigs not only serve the world with pork—and sometimes trichinosis; they also supply the material found on the end of every toothbrush handle.

Realizing that a paucity of pigs would seriously affect the toothbrush industry, Japanese scientists have succeeded in producing synthetic bristles by treating viscose threads with a solution of uric acid. Commercially the product is known as "Cellofil" and, according to all reports, will give the pigs a run for their money.

It appears as though B.O. has another use besides serving as an incentive for the manufacture of soap.

Sebasic acid, an important constituent of human perspiration, is now manufactured on a commercial scale and is incorporated as a plasticizer in certain synthetic plastics. The final product is said to be practically free from odor.

Not so very long ago lithium was considered to be a rare and expensive element with limited usage. With the discovery of new and better processes for obtaining it from its ores it has now become one of the cheaper metals. And today its uses are legion. Some of these follow:

1. Lithium chloride as a dehumidifying agent.
2. Lithium oxide in the manufacture of glass.
3. Certain lithium compounds as fluxes in the ceramic industry.
4. Lithium compounds in medicine, and in pyrotechnics.
5. Lithium chloride as flux in welding.
6. Numerous alloys.

One of the Chemist-magician's favorite tricks is to change milk into wine. Unfortunately the product of transformation offers no gustatorial satisfaction.

In an endeavor to utilize the excess whey of Denmark, research chemists, apart from the realm of magic, have prepared the "real thing" from the serum of lacteal fluid.

Ever since the discovery of the heavy electron scientists have been trying to find a suitable name for it. Americans have suggested Barytron, which is the Greek word for heavy. On the other hand, European scientists have leaned toward the name Yukon in honor of the Japanese physicist who first postulated its existence.

EMPLOYMENT

Chemists Available

ORGANIC CHEMIST. B.A. degree. Age 26. Graduate experience Columbia University in Synthetic Organic Chemistry. One year New York University Organic research. Knowledge of X-rays. Please reply to Box 51, THE CHEMIST.

CHEMIST, 42 (Ph.C., F.A.I.C.), American born, experience in chemical and pharmaceutical products, foods, specialities, etc. Able to handle analytical, research, production cost and supervision. Miscellaneous pharmaceutical compounding, medicinal and chemical preparations, a specialty. Writer is known for technical publications in the U. S. and abroad. Out of position on account of abandonment of plant with which I had been affiliated for past ten years. Excellent references. Please reply to Box 53, THE CHEMIST.

CHEMICAL ENGINEER, F.A.I.C., Age 33. Wants to organize and operate a trouble-shooting and operations development department in a medium-sized manufacturing plant. Varied experience with Bureau of Standards, Du Pont, and others qualified me for this work in many fields. Please reply to Box 111, THE CHEMIST.

CHEMIST, Ph.D., F.A.I.C., seeks position in industrial research or teaching. Major field organic. Eleven years experience teaching organic, analytical and advanced inorganic in university. Some direction of research and consulting work. Age 33, married. Phi Beta Kappa, Sigma Xi, Phi Lambda Upsilon. Please reply to Box 51, THE CHEMIST.

CHEMISTRY PROFESSOR, F.A.I.C. Ph.D. from leading Eastern University, seeks permanent teaching position in a university or college, preferably with opportunity for research. Major field organic; has also taught inorganic and analytical; independent research. Eleven years teaching, four years industrial experience; now teaching. Location immaterial. Please reply to Box 25, THE CHEMIST.

ORGANIC DEVELOPMENT CHEMIST, B.S., A.A.I.C. Age 35. Has had eleven years of practical laboratory and plant experience with a large manufacturer of dyestuffs. Desires employment with an organization in the consulting field. Please reply to Box 41, THE CHEMIST.

Do you need a chemist or do you know of some one who does? Chemists of exceptional ability and high professional standing can be reached through THE CHEMIST.

Chemists Wanted

CHEMIST with experience in the production of baking supplies.

CHEMIST with considerable experience in the field of lithol-toners. $2600.00.

CHEMIST with exceptional experience in major cosmetic manufacturing company along the lines of research, development, and production, for cosmetic firm located in the east. Must be A-1 man. Salary high.

CHEMIST, Ph.D., major in organic chemistry from Harvard, Yale, Cornell, or Mid-western University. $3000.00

CHEMIST experienced in the field of dry color manufacture, especially chrome-yellow.

For the above positions, please reply to Box 52, THE CHEMIST.

The Fourth Special Summer Course in Colloid Chemistry and Physics will be given under the supervision of Dr. Ernst A. Hauser at Massachusetts Institute of Technology for five weeks, beginning July twenty-fourth. The program will consist of lectures, round-table discussions, practical training in laboratory and research work, and is offered to men actively engaged in industry or research and to graduate students.

The activities of the Government Laboratory, London, have increased for the year of 1938, according to a report by Sir J. J. Fox, Government Chemist. The total number of samples examined was 562,549, an increase of 17,306 for the previous year. Much work has been carried out in connection with the revision of existing analytical methods and the investigation of new methods of determination of substances.

Glass Blowing Manual

The Laboratory and Pharmaceutical Division, Corning Glass Works, Corning, New York, has recently published a manual "Laboratory Glass Blowing with 'Pyrex' brand Glass". It contains information on the working characteristics of "Pyrex" brand G glass, and explanation of fundamental glass blowing operations, and recommendations of suitable tools, and equipment. The manual will be supplied without charge, upon request, to users of Corning Glass Works' laboratory glassware.

Ed. F. Degering, F.A.I.C., professor of organic chemistry at Purdue University, has been appointed editor-in-chief of a series of chemical books to be published by Harper and Brothers.

Chemical Markets in Bolivia

According to *World Trade Notes on Chemicals and Allied Products*, published by the Bureau of Foreign and Domestic Commerce, Bolivia is a good market for imported chemicals and related products. The local chemical industry produces soaps, toiletries, polishes, and biologics in limited quantities and mainly from imported basic materials. A law passed in 1938 requires chemical manufacturers to have a competent chemist in charge of their plants.

Iowa State College Press

A new publication outlet for manuscripts dealing with science and technology has been provided at Iowa State College, Ames, Iowa, by the recent organization of the Iowa State College Press. The new press will consider for publication manuscripts of book length not from Iowa State College alone, but from any source. It will be especially interested in developing publications in certain subject matter fields in science and technology for which satisfactory publications channels are not elsewhere available.

Donald H. Andrews, F.A.I.C., professor of chemistry at The Johns Hopkins University, and newly elected Councilor of THE AMERICAN INSTITUTE OF CHEMISTS, will spend the summer in Europe.

Correction

The article entitled, "Health Hazards in Chemical Industries", which appeared in the April, 1939, issue of THE CHEMIST was erroneously credited to Dr. Henry F. Smyth, Jr. The author was Dr. Henry F. Smyth, Sr., assistant professor of industrial hygiene at the University of Pennsylvania.

For Sale

THE CHEMIST, volumes seven to ten (1930-1934), volumes eleven to fourteen (1934-1937). To be shipped from Montclair, New Jersey, express collect. Please make offer before July fifteenth.

Ferdinand F. E. Kopecky
3707 Meramec Street
St. Louis, Missouri

Education Information Service

Educator's attending the New York World's Fair will find a specialized Information Service designed to meet their particular needs, according to an announcement made by Harry Woodburn Chase, President of New York University and Chairman of the Fair's Advisory Committee on Education. This service will be located in the Science and Education Building and will answer questions about the cultural and educational features of the Fair, and will offer full information on educational activities in New York City.

The Chemist

The next issue of THE CHEMIST will appear in September with plans for the season of 1939-1940. Interesting articles scheduled for this issue include "The Chemist in the Pharmaceutical Industry" by Dr. Joseph Ebert, president of the Farastan Company, Philadelphia; "The Relation of Research and Invention to Economic Conditions" by Dr. Frank B. Jewett, president of the Bell Telephone Laboratories, New York, and "The Chemist in the Field of Modern Illumination" by Robert J. Mackey of the Sun Manufacturing Company, Chicago.

We are deeply appreciative of the interest and helpful coöperation shown by members of THE AMERICAN INSTITUTE OF CHEMISTS this season in contributing articles and material to THE CHEMIST which have enabled it to be of outstanding professional value. We invite the same coöperation and exercise of mutual helpfulness for next year. It is through such mutual assistance among chemists that the profession of chemistry can be advanced. Articles on professional (not technical) subjects, news items, pertinent clippings and comments are all welcome.

In the meantime, we wish all our readers a most pleasant summer.

How to handle today's problems in organic synthesis . .

What are the problems of organic synthesis that arise in actual plant practice? What are the techniques employed? Twelve specialists present in this up-to-date manual a systematic treatment of the principles and practice of reactions in organic synthesis in a practical way.

Just Out! New 2nd Edition

UNIT PROCESSES in ORGANIC SYNTHESIS

***Edited by* P. H. GROGGINS**

Bureau of Chemistry and Soils, U. S. Department of Agriculture

769 pages, illustrated, $6.00

IN THIS book the term *unit processes* is used to represent the embodiment of all the factors in the technical application of an individual reaction in organic synthesis. The book codifies the underlying principles and factors. In discussing each reaction it presents: 1.—an examination of the reactants; 2.—an inquiry into the mechanism of the reaction; 3.—a description of the chemical and physical factors involved; 4.—observations regarding the design and construction of equipment; 5.—a study of typical technical applications. As the Editor says in his Preface: "Once the principles are mastered, it matters little in what branch of chemical technology these processes are carried out."

This revised edition—the work of eleven well-known specialists—contains much new material on new developments in the field such as synthetic gasoline, cellulose ethers, and alkyl phenols. There is increased emphasis on developments in aliphatic chemistry.

Copies may be obtained from

THE CHEMIST

233 BROADWAY NEW YORK, N. Y.

HEADQUARTERS FOR

HIGH VACUUM

also for

VACUUM REFRIGERATION
VACUUM DEAERATORS
DEAERATING HEATERS
HEAT EXCHANGERS
SURFACE & BAROMETRIC CONDENSERS
NI-RESIST & MISC. CASTINGS

The Croll-Reynolds Company has the exclusive record of specializing entirely on steam jet vacuum apparatus during the first ten years of its history. Thousands of installations have been made for practically all types of vacuum process work in chemical plants and related industries. A great many mechanical vacuum pumps have been replaced and substantial savings effected in operating and maintenance cost as well as in improved vacuum and more dependable operation. Steam Jet Evactors have absolutely no moving parts to get out of order. Their capacity, efficiency, dependability and relatively low cost have resulted in a definite and increasing trend toward this type of equipment for all vacuum work down to .2 mm. absolute. Bulletin C-105 on request.

CROLL-REYNOLDS CO., Inc.

17 JOHN STREET NEW YORK, N. Y.